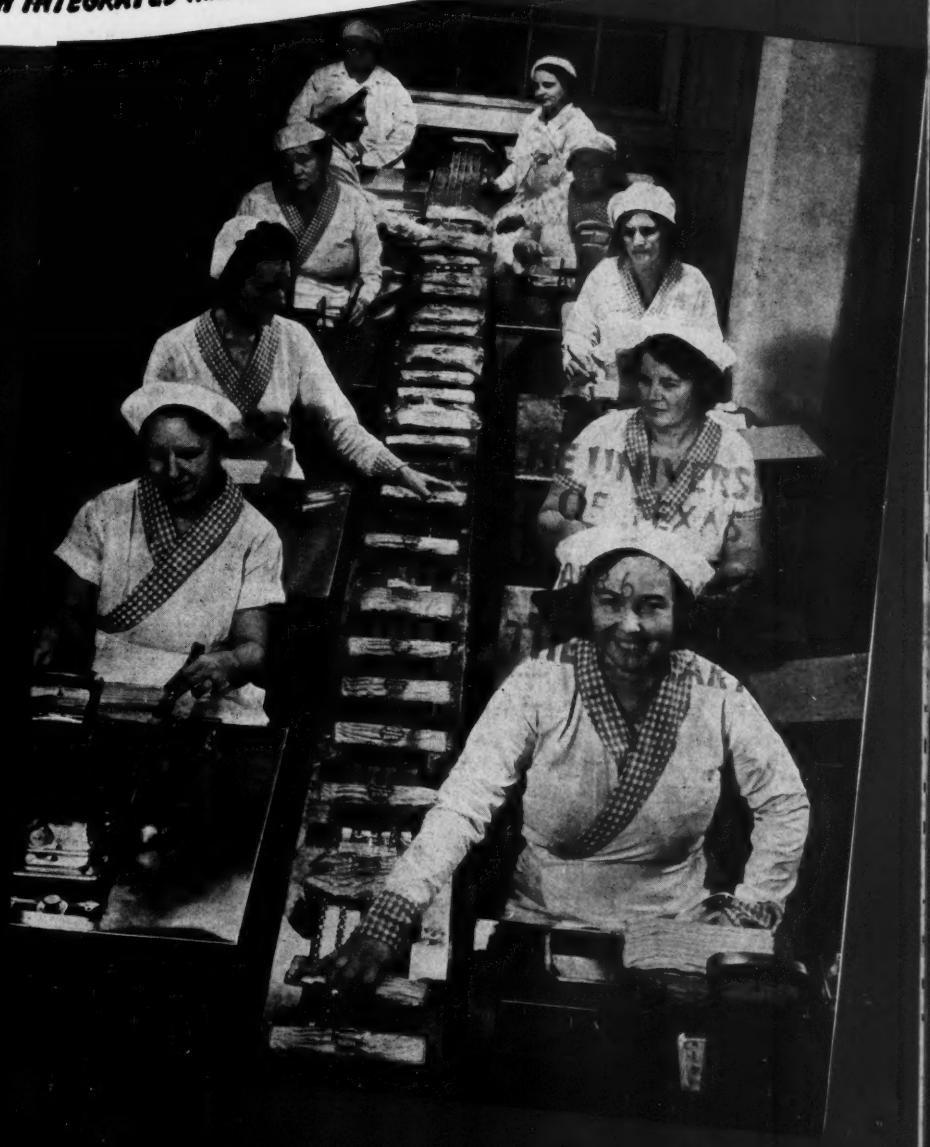
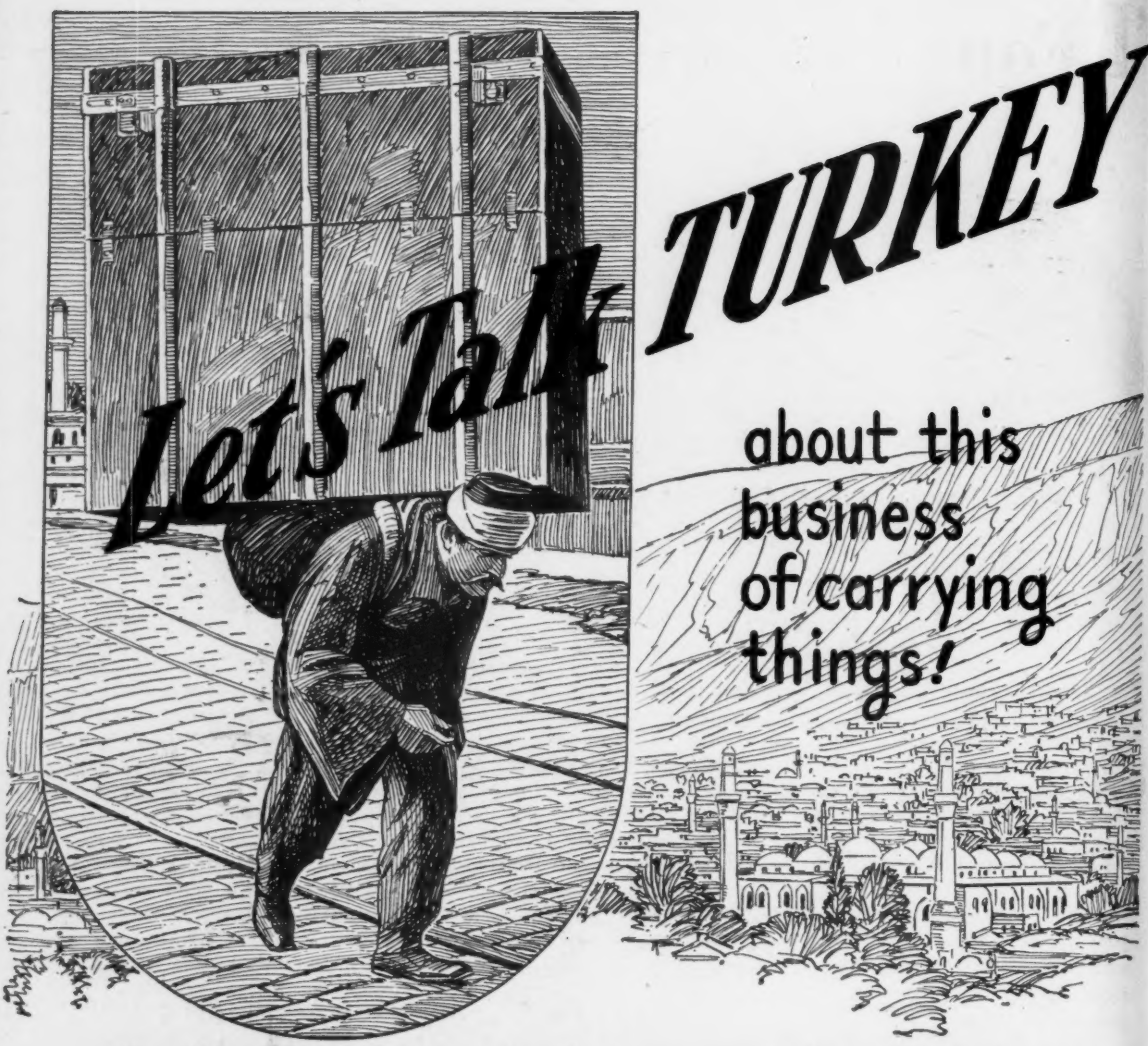
Flow

THE MAGAZINE WHICH INTEGRATES MATERIAL HANDLING EQUIPMENT INTO THE FLOW OF PRODUCTI



IN THIS ISSUE: Goodbye, Messy Chips... It Hits the Spot... Push and Pull
A Big Job Key to Efficiency Five Tons in Two Minutes



Man-handling of heavy loads is commonplace out Ankara way, where backs are willing and wages are small. But it's one kind of Turkish Delight that isn't relished here at home — not while a Truck-Man can carry even heavier loads in less time, at less cost and without effort.

Gasoline power and a hydraulic lift take all the burden of carrying and lifting—of skidded loads up to 2000 pounds. Compactness to snake around machines and along narrow aisles, with a second speed for brisk travel on the straightaways.

If the saving of man-hours or the paring of production costs mean anything in your business, Truck-man deserves your consideration.

Ask for the descriptive bulletin.

truck-man

a product of

YARD-MAN INC.

1418 West Ganson, Jackson, Mich.

"I Found 8 Words of Magic Power In This Ad!"

"They *REALLY CUT* my handling costs!"

"The words that caught my eye were 'Let me cut your handling costs in half!' I never paid much attention to material handling . . . except I knew in round figures about what it cost us to have a lot of truckers push, pull and tug our hand-trucked loads around the plant. It was something the boys in the plant handled, definitely not a pressing problem for management. At least, so I thought, until . . .

"The coupon I skeptically mailed brought an A.T.C. Specialist around to take a look at what we were hauling. It didn't take him long to show me that what we had put down as 'fixed expense' could be turned into 'fixed profit,' simply through the use of a miracle electric truck all industry knows as Automatic Transporter.

"It's a brawny truck all right, and it sure reduces the need for brawn in our plant. One man or girl just guides and steers two to three tons with a nonchalant grasp of a handle, and the push of a button. Two of our three truckers now are doing more productive work. And everybody's happier. Management, because we've cut our handling costs in half. Labor, because it lightens their load, lets them work like men."

Put those 8 words of magic power to work for you in your plant. Mail the coupon.

Remember: Only AUTOMATIC Makes the TRANSPORTER

Transporter
A PRODUCT OF AUTOMATIC
Lightens LIFE'S LOADS

AUTOMATIC TRANSPORTATION CO.
Div. of The Yale & Towne Mfg. Co.
141 West 87th Street, Dept. D, Chicago 20, Ill.

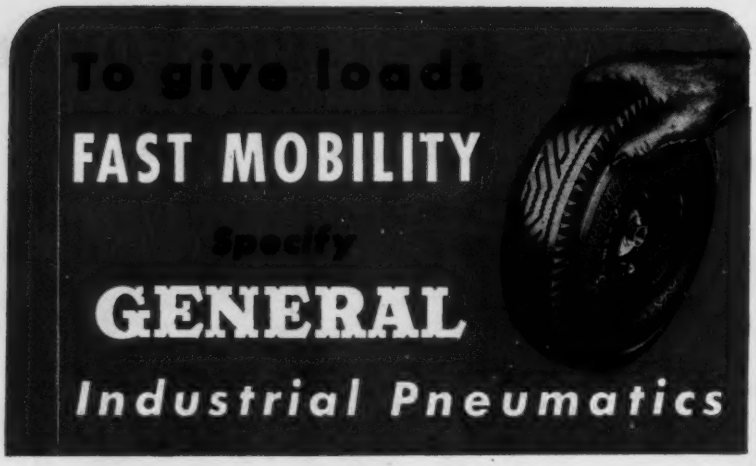
☐Please mail me, without cost or obligation, complete facts about AUTOMATIC TRANSPORTER, the Miracle Electric Truck . . . plus *proof* that it has cut handling costs at least in half.
☐Have an A.T.C. Material Handling Specialist call.

Company Name.....

By..... *Position*.....

Street Address.....

City..... *State*.....



● Heavy loads or mobile equipment . . . move smoothly and faster over rough, soft or smooth surfaces on General Pneumatics. You avoid the spillage and breakage of "rough rides" . . . reduce labor requirements, equipment maintenance and end floor wear and *roll-resistance* of old-style hard wheels.

ONLY General Pneumatics have the extra-capacity wide-base rim . . . *quick demountable* wheel . . . provide assembled tire-tube-wheel units . . . always ready for use. General Pneumatics are the *standard* of the Army Air Corps for ground service.

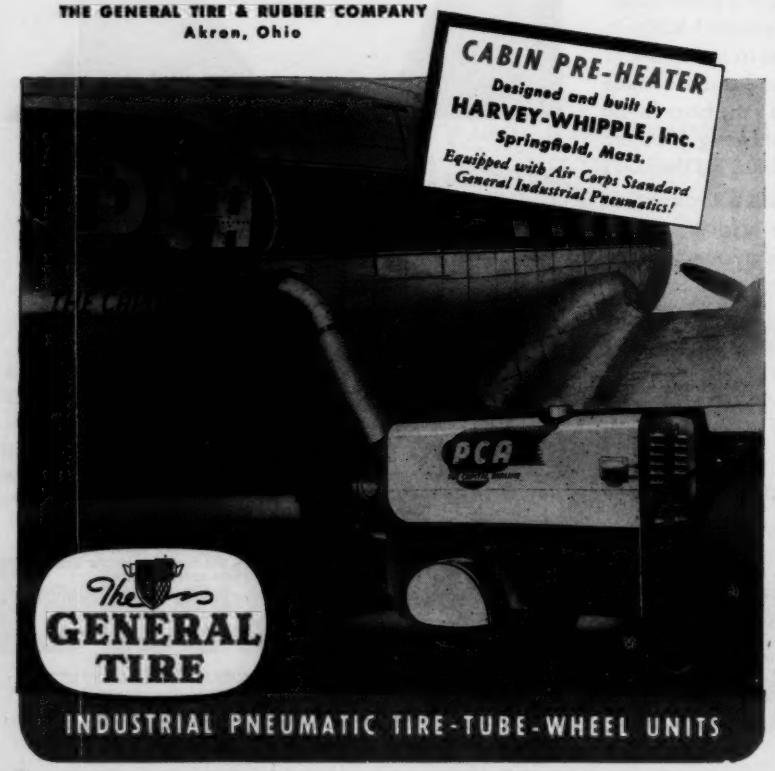
On new material handling trucks or portable equipment *specify* General Industrial Pneumatics.

ASSEMBLED!

Heavy-duty Tire • Separate Tube • Standard Wheel

8" to 22" o. d. for loads of 180—1900 lbs. per tire

Dept. 7
THE GENERAL TIRE & RUBBER COMPANY
Akron, Ohio



To FLOW:
Closely Related Fields

Our concern is interested in package engineering and material handling, and we feel that your magazine would fit into our picture.

Would you please inform us as to how you handle the distribution, whether it is on a subscription basis or in some other manner.—Ray E. Frase, Packaging Engineer, Addison-Semmes Corp. (Industrial Packaging), Racine, Wis.

To answer the question of other correspondents, FLOW is a paid circulation magazine. The rate is $2 per year, or $3 for two years.—Ed.

To FLOW:
"No Dead Wood"

Enclosed you will find my check of $3 in payment of my subscription for two years to FLOW.

I have completed reading the first issues and think that you have done an outstanding piece of work. The articles and pictures are interesting and there seems to be no dead wood.

I am very interested in obtaining the article by George Lacay of Midtown Warehouse, Inc., N. Y. C. I understand that it appeared in the January issue and would appreciate your sending me a copy.—Edmund C. Horman, 231 East 76th Street, N. Y. C.

This article, which deals with a modernized warehousing operation, has drawn a number of responses from readers. A recent one was a request for permission to reprint it.—Ed.

To FLOW:
FLOW Articles Are Reprinted

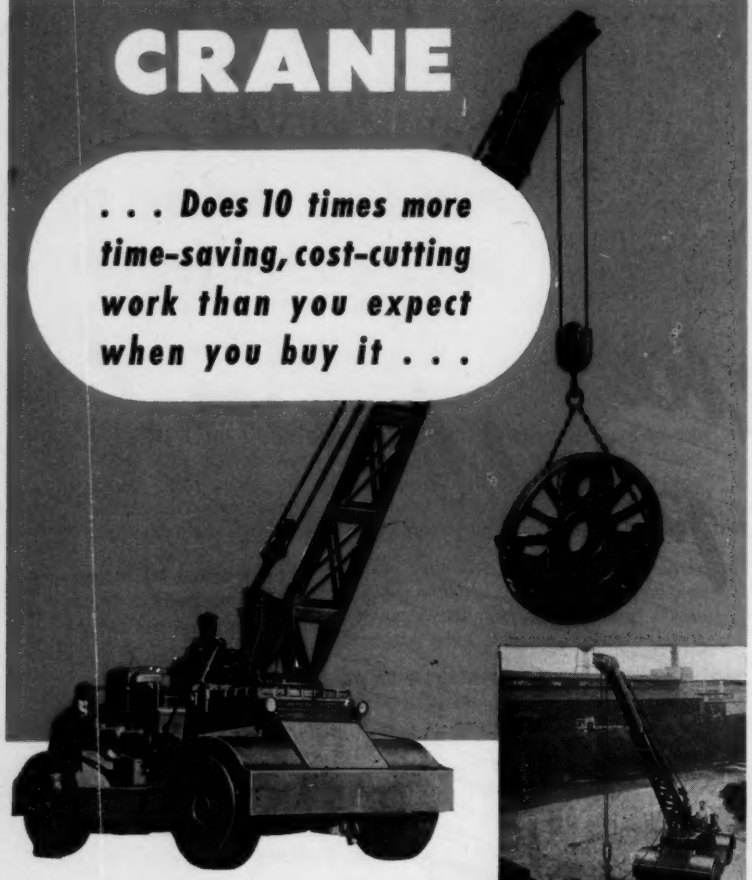
Just had the pleasure of going over the October 1945 issue of FLOW and want to congratulate you on an excellent magazine.

In going through the pages, I ran into something that would be of great interest to our readers—the article on Pages 48 and 49 entitled, "Does Floating Storage Solve Your Problem?" I would like

WHY shuttle several costly units from platform to platform when you can
move the whole platform!
One tractor with one driver can keep several platform trailers busy.
Load and unload by running your electric trucks right onto the trailer. Tractor is released for other work while the trailer is being loaded.
Pick up the ready trailer and move it to any part of your plant—from building to building, or from loading to shipping platform.
If you have an extensive intra-plant materials handling problem you can reduce costs and increase efficiency with EASTON off-the-highway platform trailers. The trailer illustrated is the EASTON Model TP-15 built to your standard platform height with 180 sq. ft. of loading area, and a capacity of 30,000 lbs. Other sizes and capacities are available. Write for information: Engineering Counsel, Easton Car & Construction Co., Easton, Pa.
EASTON
TRAILERS · TRUCK BODIES
CARS · ELECTRIC TRUCKS
ENGINEERED
A-1010

ROUSTABOUT CRANE

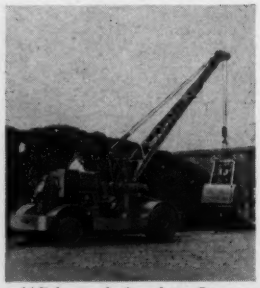
. . . Does 10 times more time-saving, cost-cutting work than you expect when you buy it . . .



The fast-action load-handler all around your place

Hundreds of users who have bought the Roustabout with a few jobs in mind, soon had it speeding 101 jobs of loading, unloading, moving, shifting and stacking, indoors but especially out. Mobile, it's *where* you want it *when* you want, over rough ground or smooth, up hill and down, handling anything to 7½ tons. Modernly engineered for years of overwork, ball-bearing boom turntable and gears all running in oil. It saves costly delays and manpower, quickly pays for itself. Write for the whole efficiency story now — no obligation, of course.

• Equipped with magnet, Roustabout handles scrap, ingots, etc.



• With grab-bucket, Roustabout hustles sand, cinders, etc.

THE HUGHES-KEENAN COMPANY
648 NEWMAN STREET • MANSFIELD, OHIO

ROUSTABOUT CRANE

Roustabout Cranes
By Hughes-Keenan
Load-Handling Specialists Since 1904

very much to get permission to borrow this story and also the photos which you used in making the cuts.

We will be glad to give you due credit, and will return the pictures to you as soon as they have been used.—F. P. Hankerson, Editor, The Wooden Barrel, St. Louis, Mo.

FLOW gladly grants the permission to The Wooden Barrel, publication of Associated Cooperage Industries of America. This, incidentally, marks the fourth article to be reprinted from the pages of FLOW.—Ed.

To FLOW:
"Very Valuable"

Your magazine FLOW is being received by the writer, and is very valuable to me. You should be complimented on the presentation of the variety of subjects.—Glenn R. Evans, Waukesha Motor Co., Waukesha, Wis.

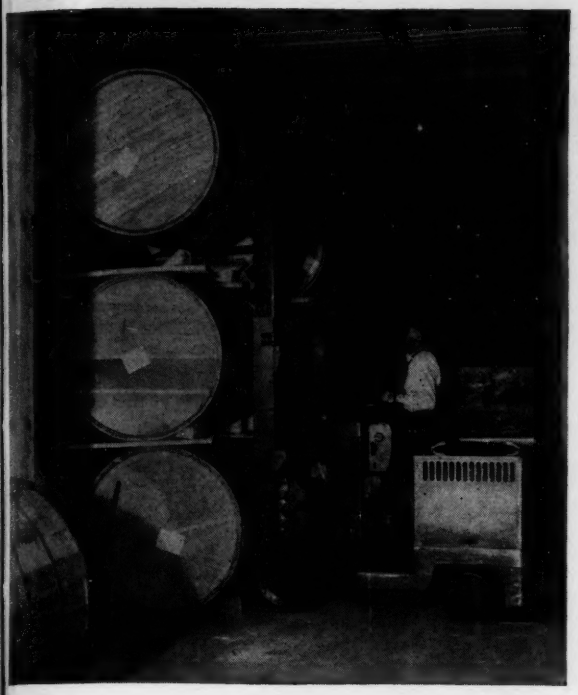
To FLOW:
Chooses His Industry

I am reading with interest your first issue. I am in the process of returning to civilian life after several years of service in the Army, including two years of overseas combat duty. I have been interested in material handling and believe it provides a fine new field of endeavor. In the next few months I plan to investigate the possibilities, as well as my qualifications, of establishing myself in some branch of the business.

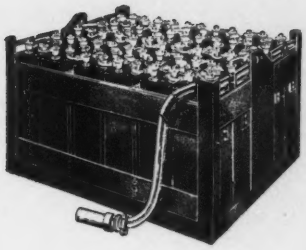
I would appreciate your sending me any of the publications described on page 67 of the October issue, so that I may study the various products and manufacturers.

Your magazine is available to me now through a friend, but I shall send you my check for a subscription in the near future.—W. L. Heitmiller, 2148 Stanford Ave., St. Paul, Minn.

Hundreds of inquiries received for FLOW "free literature" indicate that the "Catalogs, Literature and Bulletins" department is as popular as any in the publication. A breakdown of requests shows that it is considered a valuable source of information by company officers, purchasing agents, industrial engineers as well as by managers of material handling departments.—Ed.



BATTERY TRUCKS work without "fussing and fuming"



...ALKALINE BATTERIES give most trouble-free power

THERE is nothing temperamental about battery industrial trucks. Battery power and electric-motor drives give them instant self-starting, rapid yet smooth acceleration, and quiet fume-free operation. This makes for safe tiering, safe handling of fragile loads, safe operation in confined quarters or in the presence of fire hazards.

In addition to instant self-starting, battery industrial trucks consume no power during stops. This makes for high power efficiency in the stop-and-go service that is inherent in material handling work. And the current used for battery charging is low-cost power.

Electric motor drives have a minimum of wearing parts, thus minimizing maintenance, repairs and time out of service. With batteries exchanged at intervals of 8 to 12 hours, battery industrial trucks, in actual practice, give round-the-clock operation with a day-after-day regularity that you can hardly believe possible until you have had experience with them.

Altogether the battery truck is an inherently dependable and economical material handling machine . . . especially when powered by Edison Alkaline Batteries. With steel-cell construction, a solution that is a preservative of steel and an electrochemical principle of operation that is fool-proof, alkaline batteries are the most durable, longest-lived and most trouble-free of all batteries. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. In Canada: International Equipment Company, Limited, Montreal and Toronto.

Edison
ALKALINE BATTERIES

Materials movement steps up and production costs come down when Mobilift enters the picture. Mobilift makes your manpower many times more productive. By eliminating rehandling it speeds up materials movement. It enables you to take full advantage of every foot of storage space. These savings of manpower, time and space have helped hundreds of plant executives to cut production costs. Let our engineers show you how quickly a Mobilift system will pay for itself in your plant.

SALES OFFICES:

34-48 Steinway St., Long Island, N.Y.
2430 South Parkway, Chicago 16, Ill.
107 Walton Street N. W., Atlanta, Ga.

50 Ton Load!...Operator is SAFE with Orto

COMPRESSION BRAKING

All Orton Diesel Cranes are equipped with a 3-speed *and reverse* transmission, located just behind the engine to control the speeds of *all* operations of the crane. When lowering a *heavy load*, the transmission is put in reverse and the load is lowered against compression of the engine exactly as you brake your car going down hill in second gear.

Just as in your car, the compression of the engine keeps the load from running away, with no po bility of dropping it. Fine control is secured with the *fricti* brake, *which gives fine control only,* an not relied upon for the safe holding the load.

LOAD IS LOWERED AGAINST COMPRESSION OF ENGINE EXACTLY AS YOU BRAKE YOUR CAR GOING DOWN HILL IN SECOND GEAR

Compression braking is the Orton inv tion which made the Diesel crane *practi* for handling heavy loads. *Send for O Catalog No. 77 giving detailed descript*

NOW A DIESEL CRANE IS *SAFE*

ORTON CRANE & SHOVEL CO.

608 SOUTH DEARBORN STREET • CHICAGO 5, ILLINOIS • OFFICES IN PRINCIPAL CIT

How Bulk Materials are Stored and Reclaimed on the same BG Conveying System

Stock piling materials from cars or processing equipment is only half the job. Reclaiming that same material for use is frequently a major problem. A Barber-Greene Belt Conveyor and Car Unloader system successfully solves such a problem. After stock piling is completed, the belt conveyors are turned end for end and they are then loaded by the Barber-Greene Car Unloader direct from the stock pile in conjunction with a bulldozer to feed the Car Unloader. Cost for a reclaiming system is eliminated. And a unified system is provided for seasonal or cyclical material handling. In addition, a steady flow of material is maintained entirely independent of the operator's efficiency. In fact, the capacity of the entire operation is maintained at a constant speed throughout the day.

Barber-Greene engineers and consultants will be glad to work with you in solving your individual material handling problem.

Barber-Greene Company, Aurora, Illinois.

BG Barber-Greene

CONSTANT FLOW EQUIPMENT

LOADERS • PERMANENT CONVEYORS • DITCHERS • PORTABLE CONVEYORS • FINISHERS • BITUMINOUS PLANTS • COAL MACH

The right Tire for every job!

UNITED STATES RUBBER COMPANY

Serving Through Science

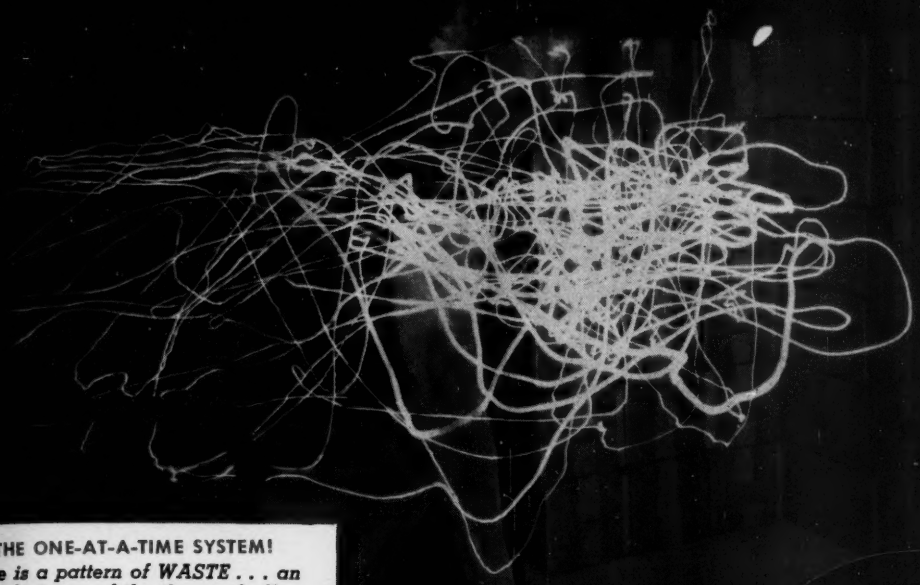
1230 Sixth Avenue • Rockefeller Center • New York 20, N. Y.

Do you have RESERVE POWER for *Emergencies?*

Gould Kathanode power gives your electric trucks the ability to meet unexpected situations. In an emergency there is power for sustained speed or for adding another load or two during a busy day.

In a Gould Kathanode battery the extra protection of the famous Kathanode Unit minimizes active-material losses. A smaller sediment chamber is practical. This means larger plates, actually a larger battery in the same over-all size container. Under ordinary conditions a Gould Kathanode does not work at full power. In an emergency you can depend on it for reserve power.

Write Dept. 104 for Catalog 100 on Gould Kathanode Glassklad Batteries for Industrial Truck and Tractor Service.



THE ONE-AT-A-TIME SYSTEM!
Here is a pattern of WASTE . . . an actual picture of the time and effort involved in stacking just 18 cartons for shipment! Light bulbs attached to the man's wrist enable the camera to trace every move.

Which Pattern Do *You* Follow?

Is yours the pattern of *waste* as shown in the authentic camera record above? Or is it the pattern of *thrift* at the right? (The same job as done with Barrett Lift-trucks and Skids.)

This particular job—stacking goods for shipment—is common to all plants. And all too often it's done the *costly* way . . . loads hauled to the shipping room on platform trucks . . . unloaded . . . set in piles to await shipment . . . then *reloaded* when trucks or freight cars arrive. The Barrett Lift-truck System eliminates all that! Your materials *stay on Skids,* ready to roll without reloading. And they always move in larger, more profitable, unit loads—*not one piece at a time.*

The Barrett System speeds materials from room to room, floor to floor, in and out of storage—so effectively that one man does more than 3 or 4! Let a Barrett engineer show you how . . . no cost or obligation.

THE BARRETT LIFT-TRUCK SYSTEM!
Here is a pattern of THRIFT . . . saving time and effort with Barrett Lift-trucks and Skids. See how materials stay on the Skid—in a big 45-carton load—while one simple move frees the truck for other jobs!

A bookful of money-saving ideas — yours fo the asking. Wri for your free cop of the Barrett Junior Catalog!

BARRETT-CRAVENS COMPANY
3257 West 30th Street • Chicago 23, Illinois

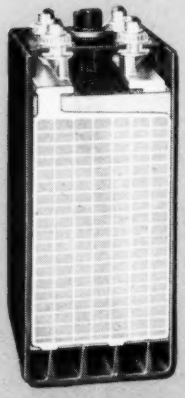
Representatives in All Principal Cities
Canadian Licensee: S. A. Armstrong, Ltd. • Toronto, Canada

BARRETT

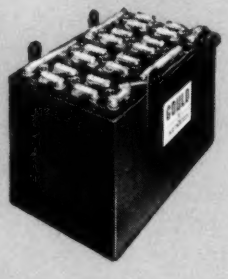
ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT

Barrett Handling Equipment

Do you have RESERVE POWER for *Emergencies?*



SEDIMENT CHAMBER
Kathanode-Unit protection permits larger plates and greater working capacity in the same over-all size battery.



Gould Kathanode power gives your electric trucks the ability to meet unexpected situations. In an emergency there is power for sustained speed or for adding another load or two during a busy day.

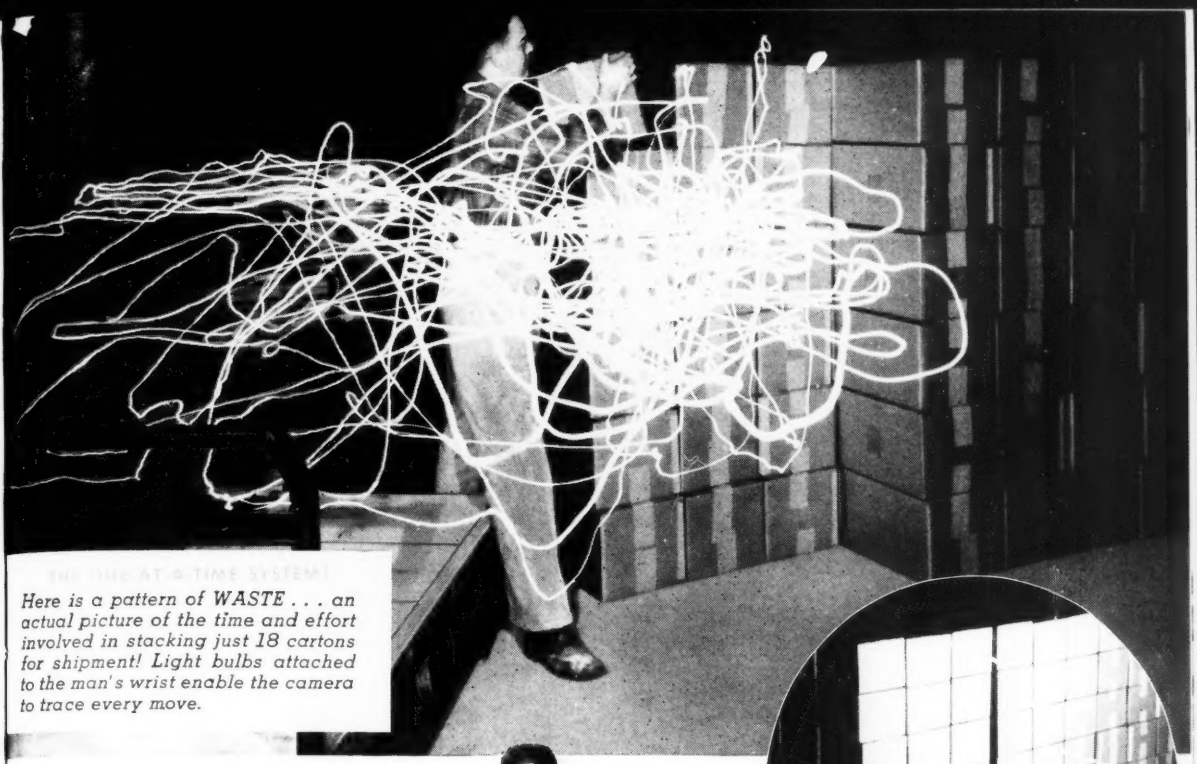
In a Gould Kathanode battery the extra protection of the famous Kathanode Unit minimizes active-material losses. A smaller sediment chamber is practical. This means larger plates, actually a larger battery in the same over-all size container. Under ordinary conditions a Gould Kathanode does not work at full power. In an emergency you can depend on it for reserve power.

Write Dept. 104 for Catalog 100 on Gould Kathanode Glassklad Batteries for Industrial Truck and Tractor Service.

GOULD STORAGE BATTERY CORPORATION, Depew, N. Y.

Factories: Atlanta • Boston • Chicago Dallas • Depew • Leavenworth • Los Angeles • North Bergen • Rock Island Saint Paul • Salem • Sioux City Zanesville

GOULD
GLASSKLAD CONSTRUCTION
KATHANODE



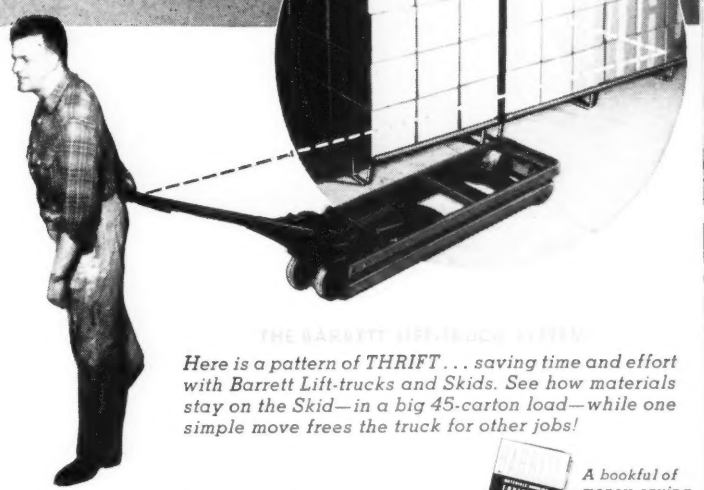
Here is a pattern of WASTE . . . an actual picture of the time and effort involved in stacking just 18 cartons for shipment! Light bulbs attached to the man's wrist enable the camera to trace every move.

Which Pattern Do You Follow?

Is yours the pattern of *waste* as shown in the authentic camera record above? Or is it the pattern of *thrift* at the right? (The same job as done with Barrett Lift-trucks and Skids.)

This particular job—stacking goods for shipment—is common to all plants. And all too often it's done the *costly* way . . . loads hauled to the shipping room on platform trucks . . . unloaded . . . set in piles to await shipment . . . then *reloaded* when trucks or freight cars arrive. The Barrett Lift-truck System eliminates all that! Your materials *stay on Skids,* ready to roll without reloading. And they always move in larger, more profitable, unit loads—*not one piece at a time.*

The Barrett System speeds materials from room to room, floor to floor, in and out of storage—so effectively that one man does more than 3 or 4! Let a Barrett engineer show you how . . . no cost or obligation.



Here is a pattern of THRIFT . . . saving time and effort with Barrett Lift-trucks and Skids. See how materials stay on the Skid—in a big 45-carton load—while one simple move frees the truck for other jobs!

A bookful of money-saving ideas — yours fc the asking. Wri for your free co of the Barrett Junior Catalog!

BARRETT-CRAVENS COMPANY

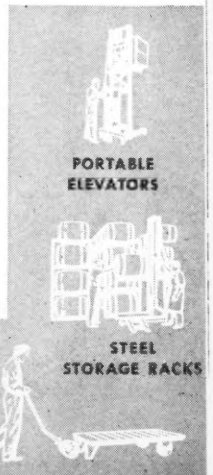
3257 West 30th Street • Chicago 23, Illinois

Representatives in All Principal Cities

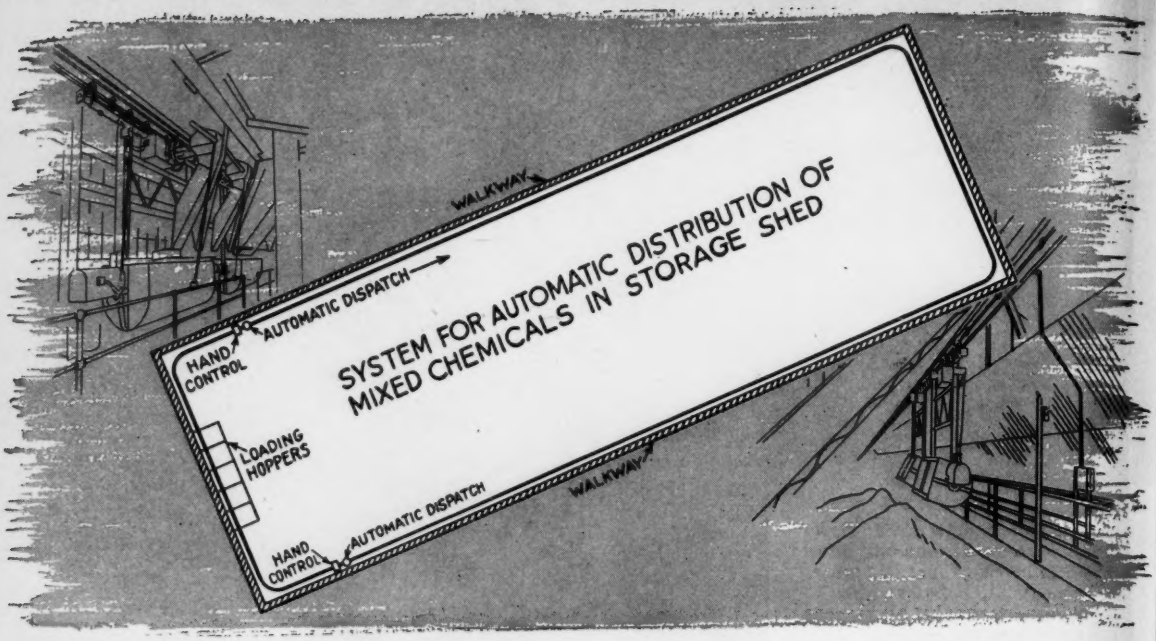
Canadian Licensee: S. A. Armstrong, Ltd. • Toronto, Canada

BARRETT

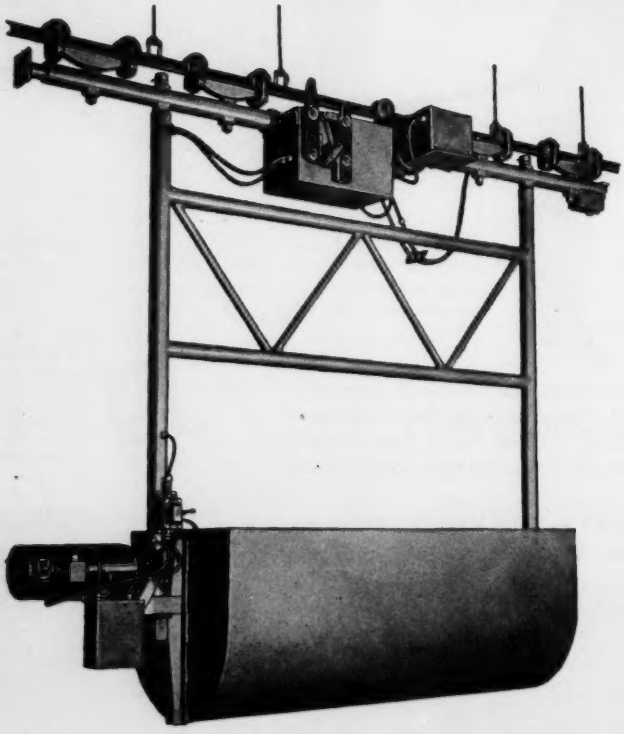
ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT



Barrett Handling Equipment



10 Years of Automatic Operation



AUTOMATIC handling is not new with American MonoRail. This system has been in operation over 10 years. Since the original system was installed, two additional automatic carriers have been added. It has been continuously operated day-in and day-out with remarkably few replacement parts.

The automatic dumping bucket carries a cubic yard — travels to movable stop at 150 f.p.m.— dumps automatically — returns to loading station at 400 f.p.m. Movable stops are set to where material should be dumped. The carrier does all the dumping after being loaded and dispatched from the loading station.

Whatever your handling problem may be, there's an American MonoRail System best suited to your individual needs. Consultation in connection with any handling problem is available without obligation.

THE AMERICAN **MONORAIL** COMPANY

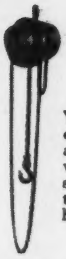
13129 ATHENS AVENUE CLEVELAND 7, OHIO

Make Every Weigh Pay!

Kron Springless Dial Scales, made by Yale, eliminate excessive time- and money-wasting handling operations, provide accurate, efficient, low-cost weighing and counting of all kinds of materials. Available in all types from bench to crane scales.

Yale Worksaver Electric Lift Trucks lift by *electric power*, travel by *electric power*, reduce material handling to little more than a strolling and steering operation. Two safe forward and reverse speeds. Models for handling skids, skid bins, and pallets.

Yale Electric Industrial Trucks save time and effort—are power-packed to speed the handling of tremendous tonnage per day—travel fast and maneuver easily in congested areas. High lift models save storage space.



Yale Hoists — hand chain and electric models—are efficient time and labor savers that make light work of heavy lifting jobs—conserve worker energy, speed production and maintenance and cut handling costs.

Clamp down on costly overweight and underweight. Both are thieves who steal time and effort, pocket your profits . . . throw you for a loss.

With Kron Springless Dial Scales, made by Yale, counting, batching, measuring, and testing are accomplished at maximum speed, and with minimum effort. You get visual weight readings of "hairline" accuracy under all conditions of use. Errors due to the "human factor" are avoided. Accurate weighing becomes a simple *load and look* operation.

In a word, precision-engineered Kron Scales provide top efficiency—save materials, save time, reduce manual handling, maintain strict control over raw materials, goods in process, and finished products.

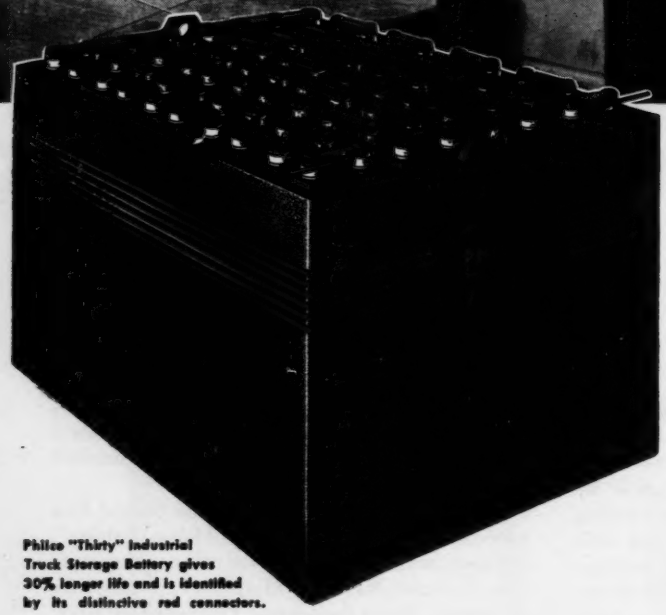
Make every weigh *pay*. Use Kron Scales! Full information about the economy of Kron "hairline" accuracy, and the advantages of other cost-cutting Yale Material Handling Machinery, is yours for the asking. Phone the nearest Yale representative, or write to headquarters.

The Yale & Towne Manufacturing Company
4530 Tacony Street Philadelphia 24, Pa.

MATERIAL HANDLING MACHINERY

CUTS PRODUCTION COSTS . . . SAVES TIME . . . SAVES EFFORT . . . PROMOTES SAFETY

HOISTS—HAND AND ELECTRIC • TRUCKS—HAND LIFT AND ELECTRIC • KRON INDUSTRIAL SCALES



Philco "Thirty" Industrial Truck Storage Battery gives 30% longer life and is identified by its distinctive red connectors.

FOR 50 YEARS A LEADER IN INDUSTRIAL STORAGE BATTERY DEVELOPMENT

Tune in The Radio Hall of Fame, with Paul Whiteman and His Orchestra, Sundays, 6 P. M., EST; The Breakfast Club with Don McNeill, 9:45 A. M., EST, Monday through Friday—ABC (Blue) Network (Coast to Coast).

MODERN ELECTRIC INDUSTRIAL TRUCKS POWERED BY COST-SAVING PHILCO "THIRTY" STORAGE BATTERIES

Now you can get the kind of industrial trucks experience has proved the safest, most flexible and maintenance-free—ELECTRIC TRUCKS! And you can power your trucks with the greatest materials handling development since the fork-lift truck, itself—PHILCO "THIRTY", the Storage Battery with 30% longer life! Plan now for the big demands increasing production will place on your materials handling equipment. Philco "Thirty" will give your trucks top capacity, *plus* savings in maintenance, depreciation and replacements. Write today for new catalogs giving specifications.

PHILCO CORPORATION • STORAGE BATTERY DIVISION • TRENTON 7, NEW JERSEY

PHILCO *Famous for Quality the World Over*

Flow

The magazine which integrates material handling equipment into the flow of production.

Vol. 1, No. 7

APRIL
1946

In this issue

Features

A BIG JOB—at Cooper-Bessemer 16
IT HITS THE SPOT—Pepsi-Cola Palletizes 19
KEY TO EFFICIENCY—Coordinated Handling and Layout 22
GOODBYE, Messy Chips 26
FIVE TONS in TWO MINUTES—modern bulk handling 28
PUSH AND PULL—when you can't put it on wheels 30
Efficient Handling Before You—BRING HOME THE BACON 32
A Challenge to Management 48
These Little (Lead) Pigs Go to Market 58
DIVERSE HANDLING PROBLEMS 60

Departments

Over Ed.'s Shoulder—Letters 2
On the Pallet—news, views, trends .. 36
The Flow Classroom—a company's training and safety methods 39
New Products—equipment of interest 53
New Literature—free material from manufacturers 57
Opportunities: Men and jobs wanted, lines available 57
Men in the News 63

EDITORIAL DEPARTMENT
CURTIS H. BARKER, JR., Consulting Editor
MANFRED SCHUELER, Editor
DON WORTH, Associated Editor

PRODUCTION DEPARTMENT
WM. V. LINAS, Director

CIRCULATION DEPARTMENT
E. J. HEXTER, Director

FLOW EDITORIAL AND BUSINESS OFFICES—
1240 Ontario Street, Cleveland 13, Ohio

NEW YORK OFFICE—CHESTER RICE
60 E. 42nd Street, Room 950
New York 17, New York, Murray Hill 2-0488

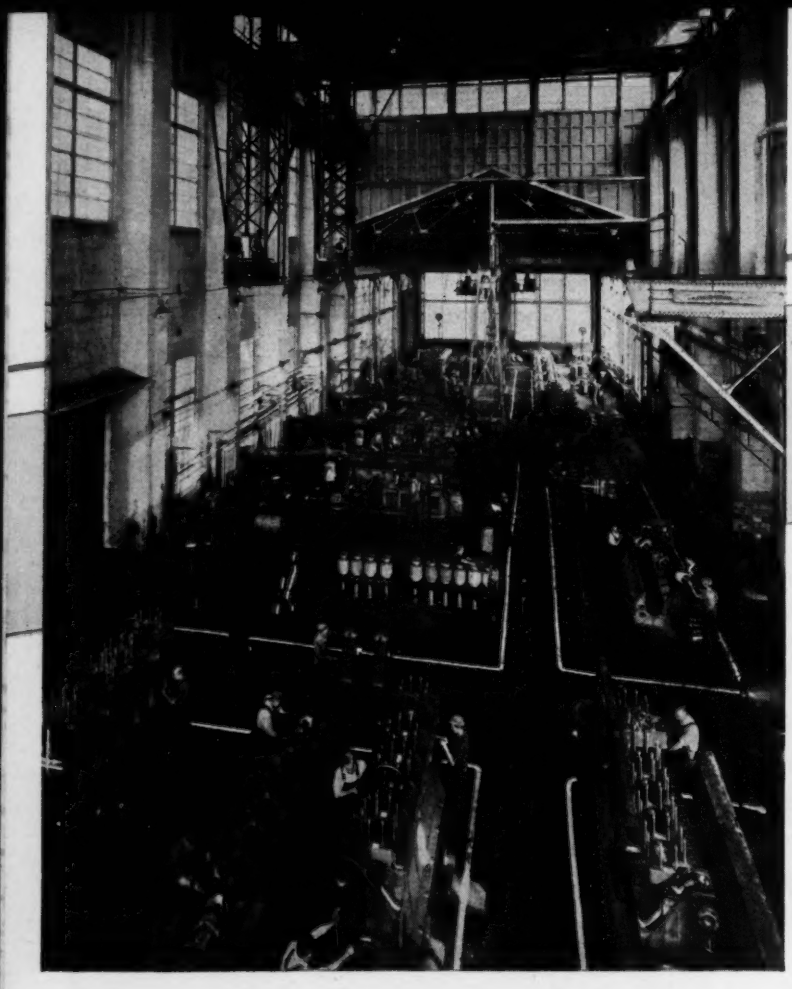
CHICAGO OFFICE—NORMAN J. LOTT
64 E. Lake Street, Room 1110
Chicago 1, Illinois, Andover 4972

LOS ANGELES OFFICE—ROBERT H. DEIBLER
403 West 8th Street
Los Angeles 14, California, Tucker 1579

SUBSCRIPTIONS—By the year, $2.00; Two years, $3.00; Single copy, 25 cents.
FOREIGN SUBSCRIPTIONS—Canada, $3.00 per year, Two years, $5.00; Foreign, $4.00 per year, flat.

Copyright 1945 by THE BOLIVAR PUBLISHING CO., Cleveland, Ohio. Published Monthly by THE BOLIVAR PUBLISHING CO., Cleveland, Ohio. IRVING B. HEXTER, President. LESTER P. AURBACH, Vice-President.

COVER PHOTO—These operators, stationed beside stainless steel conveyor, are wrapping sliced Premium bacon at Swift & Company's Union Stock Yards plant in Chicago. This is one of several such lines in air-conditioned room. Visitors to the plant view this appetizing handling operation through a window. See the story beginning on page 32.



The huge units are assembled in this area. Note the extensible cabs on cranes, at left.

Cooper Bessemer

TODAY, in the Mount Vernon, Ohio, plant of the Cooper-Bessemer Corporation, Russian engineers are present to inspect the engines and compressors which are being built to operate on a new pipe line. One of the first steps in the rehabilitation of Russia is the construction of a 500-mile pipe line from the Saratov fields to Moscow. The transporting of gas and oil to points of consumption is a new venture for the Soviet Union—one for which American-made engines and compressors will be used. Specifications call for 24 Cooper-Bessemer Type GMV-10 compressors to be installed in six booster stations located along the line. Here is how these giant units are handled through foundry, machining, finishing, assembly and crating operations.

It's a big job, but that is an everyday occurrence at this plant of the company. Engines and compressors, weighing as much as 60 tons each, are moved by cranes and flat top railway cars through machining and erecting operations. In 1853, this company, which was founded twenty years before, built the first locomotive for the Baltimore and Ohio Railroad. In 1908, the manufacture of gas engines was begun, and today, at the Mt. Vernon plant, gas engines and compressors comprise the major part of the production output.

These products are made up of large and heavy machined castings and forgings. The castings are produced in the company's foundry but the forgings are purchased from outside suppliers.

The core shop, foundry, two machine shops, and two erecting rooms are the principal buildings involved in the plant layout. Yard facilities, including a concrete storage platform, play an important part in the efficient handling of material. The flow of material in and out of the shops and from building to building is handled by a well coordinated rail, crane, and trucking system. Yard engines, locomotive cranes, flat cars, large semi-live trailer skids of special design and powered platform trucks perform tremendous lifting and carrying tasks. Within the shops themselves, many overhead traveling cranes from 10 to 50 ton capacities handle the bulk of material movement. These cranes are aided by transfer cars in moving castings from one crane area to another crane area.

In the core shop, two 10-ton and two 20-ton overhead traveling cranes are coordinated with a skid and platform industrial truck handling system in the moving of materials and products. Finished cores are taken to the foundry building on skids carried by the platform trucks.

"Foundry on Wheels"

After the cores have been assembled to the molds and the pouring operations have been completed, the larger molds are removed from the foundry on flat top cars. Five cranes, ranging in capacity from 20 to 50 tons, move flasks, molds, and ladles throughout the main bay of the foundry. This foundry is called a "foundry on wheels" because production needs for more floor area were met by the purchase of 16 flat-top cars. Cranes place the molds for the larger castings on one of these rail-born cars. As soon as the

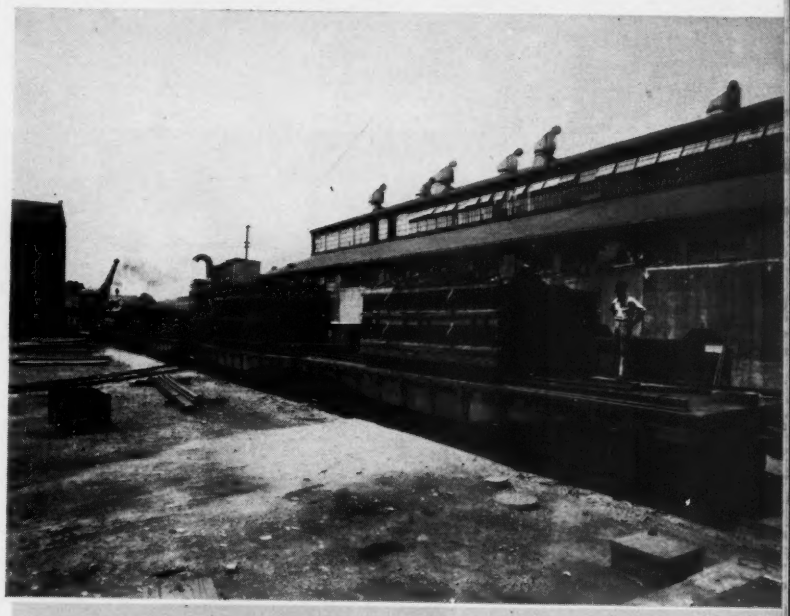
does a Big Job

Special trailer skids, cranes, yard engines, locomotive cranes—some of the devices used in the production of 70 ton units.

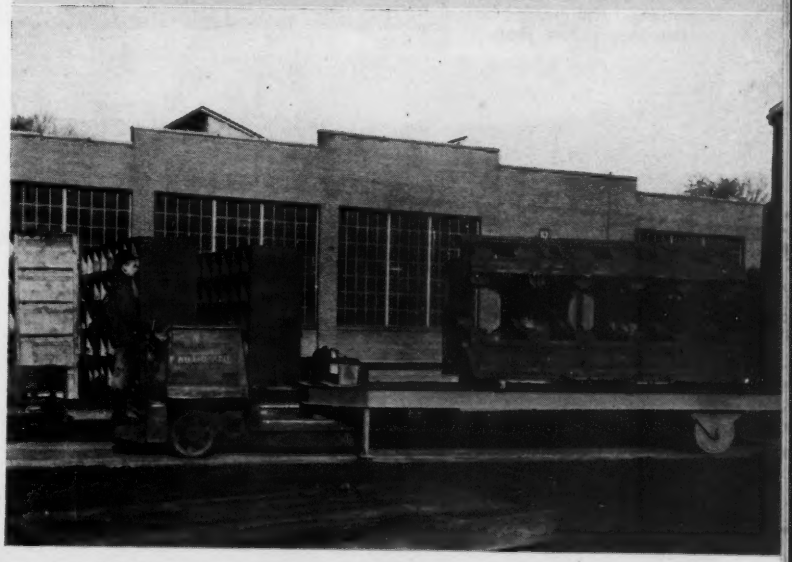
castings are poured, yard engines take the flat cars out of the building to the yards, where cooling takes place for two or three days. This permits the floor area of the foundry to be entirely occupied with productive operations.

After cooling, the molds are moved by car to the shakeout station where they are unloaded by overhead cranes. The casting is placed on a semi-live trailer skid of special design. The steel deck of this skid is supported on the front end by two legs and on the rear by two twin-tired steel wheels mounted on solid rubber. Loads of 16 to 18 tons consisting of one or more castings are moved by attaching the front end of the skid to the rear end of a five ton capacity platform lift truck. A special jig in the shape of a wishbone acts as a fifth wheel arrangement. It has two pins on the bottom which fit into holes drilled in the floor of the industrial truck. A third pin in the center of a bearing surface, at the apex of the wishbone, fits into a hole drilled in the front end at the center of the skid. This arrangement permits the platform lift truck to elevate the skid sufficiently to raise the front legs, and it tilts the skid so that most of the weight will be over the rear wheels where it belongs. The pivot action of the center pin enables the load to be swung around corners and to be spotted in the paint shop where castings are painted while on the skid.

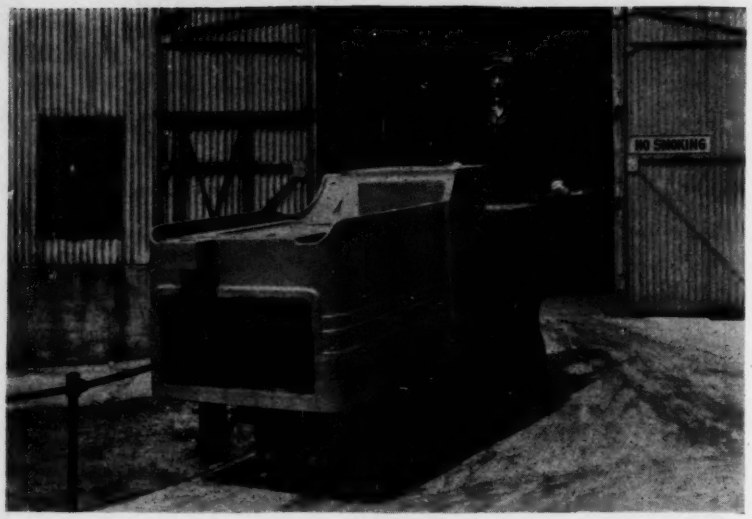
Locomotive cranes load the castings on flat cars after painting. These cranes are self-propelled and have a hinged boom and power plant installed on a turntable operated by a rotating mechanism.



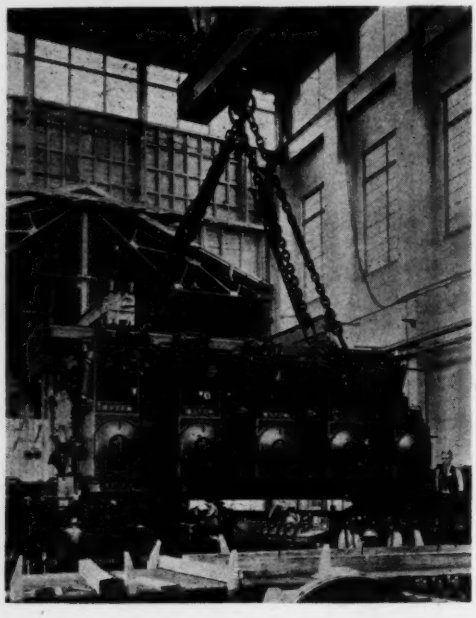
Castings are placed on flat top cars where they remain two or three days for cooling, top photo.



A platform truck with a specially designed trailer moves castings to the plant shop, lower photo

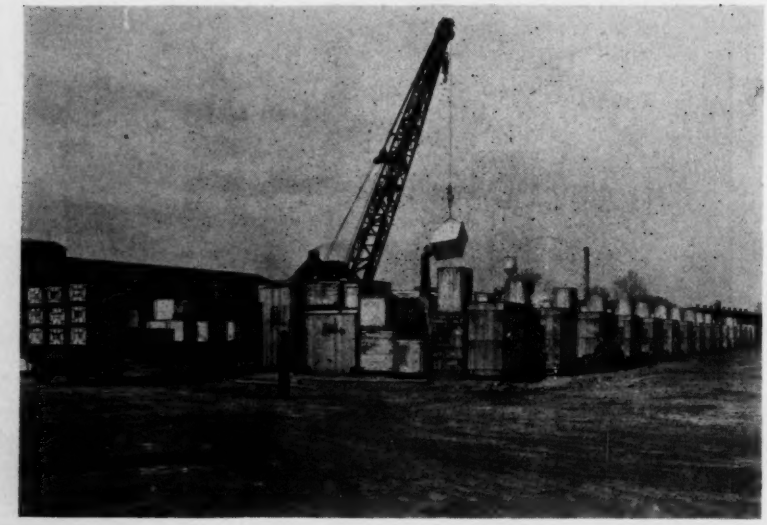


A medium-sized casting is being taken from paint shop to machining area, photo shown at top.



A 56-ton engine is lifted from an assembly station by two cranes using equalizing beam, center photo.

Here locomotive crane tiers crated units on concrete platform until ready for shipment, bottom photo.



The crane mechanism is installed on a car-body mounted on wheels which is propelled by a steam engine. Being independent of any outside source of power, these locomotive cranes travel and perform handling tasks wherever tracks are provided.

They are equipped with a plain fall block and hook for general lifting purposes and use slings or similar accessories. For handling loose material, such as molding and core sand, grab buckets are used. For handling iron and steel a magnet is used. These locomotive cranes have sufficient propelling power to haul and switch several loaded cars at a time and are reasonably fast in moving from one job to another. Their long booms reach over walls, car sides, and other obstacles, enabling them to perform various difficult handling and lifting tasks.

Yard Engines and Special Provision for Making Hitches

When the painted castings have been loaded on the flat top cars, the load is moved by locomotive crane to a yard storage area where the crane removes the castings. Some castings, however, are taken directly to the machine shops.

Heavy castings are brought into the main machine shop on flat cars via the rail system, which extends into the center area of the shop. Yard engines move the cars into the area beneath the spans of overhead traveling cranes.

These yard engines are particularly efficient in moving material about and have proved to be an economical means for making the long hauls from storage areas to buildings and vice versa. The weight of the articles moved and the amount of materials handled at one time in one haul make this method an invaluable aid to the productive departments.

In the main machine shop, the castings are removed from the cars by overhead traveling cranes. These cranes, installed on elevated runways, permit the entire area of the floor space within their range to be used for storage or manufacturing purposes. Having both transverse and longitudinal movement, they can reach any part of the floor below.

In the main bay of the machine

(Turn to page 45)

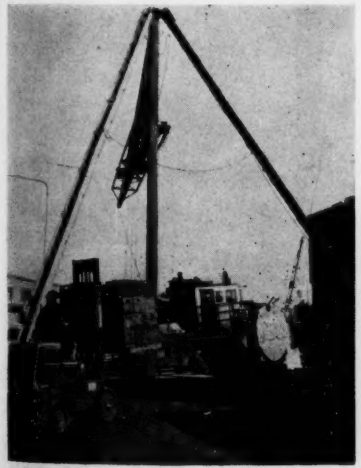
IT HITS THE SPOT

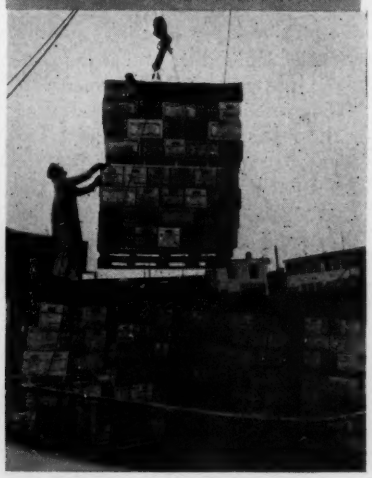
The Pepsi-Cola Metropolitan Bottling Works, Long Island City, has inaugurated delivery of pallet loads by cargo carrier on the waterways around New York City. This move may initiate a trend toward unit load deliveries in the metropolitan harbor district.

Cases of Pepsi-Cola are palletized, then moved to crane at boat loading point by fork truck, above.

Here fork truck is spotting load of soft drinks for handling by crane. Big Bottle in background, lower left.

Two pallet loads are handled at one time, but master pallet has been replaced by stevedore type, below.





THIS summer the sweltering crowds in Coney Island—and elsewhere around New York City—should have no trouble in getting all the Pepsi-Cola they want, provided of course the sugar supply is adequate. For this beverage will be (and is now being) delivered in pallet loads by a capacious river boat especially built for the purpose.

Within recent months the Pepsi-Cola Company's East River Plant made news when it inaugurated the first commercial barge operation in connection with unit load deliveries. (The Navy made extensive use of lighters in shipping supplies in New York City, Newport, Boston, San Francisco, Miami and elsewhere.) As far as is known, the present operation of the Pepsi-Cola Company is the first commercial adaptation of its kind. The company's 64-foot, 11½″ twin-screw Diesel river cargo carrier was christened "Big Bottle" sometime last October—one of two slogans used in connection with the product.

Since that time extensive preparations and tests have been made, and by now the delivery on the waterways is an accomplished and successful operation. Originally conceived during the war months, the novel delivery method was designed to save gasoline and rubber. Meantime other advantages of the cargo carrier method have become apparent. It "hits the spot" in the metropolitan high traffic area covered. Traffic congestion on motor highways—and consequent delivery delays—have been eased. Big Bottle will serenely deliver her sizable loads when frost or snow storms make highway travel hazardous or impossible. This has already been demonstrated in a number of test runs during the past winter months. While loaded trucks were stranded

on icy highways, Big Bottle was delivering her cargo without trouble.

One Pallet for Boat and Vehicles

The company started its palletization program in connection with harbor deliveries by river boat, and at the same time a pallet was designed which would be suitable both for boat as well as trailer and truck deliveries. Concurrently palletization was extended to other plant operations. Cases of bottled syrup, for example, are built into unit loads; and incoming knockdown cartons and similar supplies are palletized at the receiving point, thus reducing handling time and conserving valuable floor space. While these latter operations require pallets of different sizes (according to the dimensions of the products), the dimensions of the pallet for case deliveries are 37″x 61″. This was the optimum proportion arrived at both for use on the boat and trucks. Additional details on this point are given in later paragraphs.

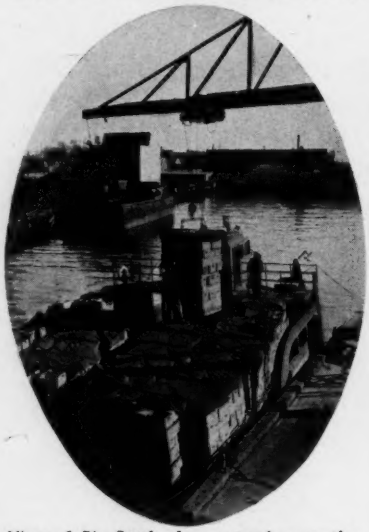
Proper loading and unloading facilities in connection with the river boat program were provided in the form of a jib-type monorail crane, shown in the photos. Cranes of this type were constructed at the loading point on the company's premises as well as at the delivery points in Coney Island, Brooklyn and other outlying districts where the company maintains warehouses along the waterfront.

Other preparations necessary were of a minor nature, according to the company's Vice President William Geisler. These concerned slight modifications of the conveyor system to facilitate palletizing in the stockroom and to provide access to all portions of the stock by fork lift trucks. The plant had been designed for conveyor operation.

Units Move from Plant to Boat

The cases of Pepsi-Cola are palletized at the end points of the various lines as they arrive from the bottling and capping operations. Fifty cases are stacked in interlocking pattern on each 37″x 61″ pallet. The completed unit is moved by fork truck to the boat loading dock where (until recently) it was deposited on a master pallet. The second pallet load was then placed on top of the first, as shown in the photos.

The master pallet, which was recently supplanted by another method presently to be described, has angle iron reenforcements and cable



View of Big Bottle, here returning empties, which is delivering palletized unit loads.

assemblies. Each set of two cables (at each end of the master pallet) terminates in a ring. These rings were put into the slots provided at each end of the spreader bar. The hoist on the crane is suspended from an electrically driven trolley which travels on the arm of the jib crane. The arm measures 40 feet, thus extending well over the boat and covering every part of its loading surface. The loads are thus conveniently spotted as they are lowered on the deck of the cargo carrier.

In this way two pallet loads, consisting of 100 cases, were handled at one time, and the boat's capacity of 5,000 cases was thus quickly reached. Unloading proceeded similarly, providing a fast operation.

In order to simplify the handling of the loads, the master pallet has recently been discontinued in favor of a stevedore pallet on which the cases are now piled. Two pallet loads (one on top of the other) are still being handled as one unit. But now a cross bar is inserted between the overhanging deck boards of the bottom pallet, and the two units are then hoisted and loaded (or unloaded) by means of rope slings. In this way the third (master) pallet has been eliminated from each load, which has tended to simplify this part of the procedure.

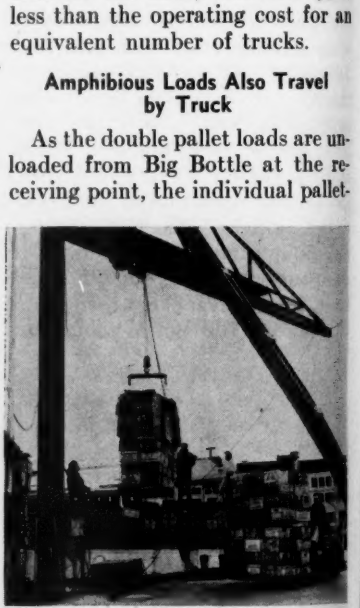
According to Vice President Geisler, the average combined loading and unloading time for Big Bottle is about two hours. To assure uninterrupted operation in handling the loads at production, loading and delivery points, three sets of pallets are provided, as follows: One set in each warehouse, one set in the boat, and a third one in the plant.

Big Bottle's speed loaded is about nine knots, or 11 land miles, per hour. Her capacity of 5,000 cases equals that of 25 retail delivery trucks, or the capacity of 10 of the larger trailers. The latter can accommodate 10 pallet loads of 50 cases each at one time.

Deliveries are made not only to the company's warehouse located on the waterways of New York, but at times also to adjacent territories; for example, some emergency deliveries to Bridgeport, Connecticut. Big Bottle makes a complete round trip to Coney Island—the most distant regular point from the plant—in a day. For the time being, the scheduled runs are confined to the company's two warehouses in Coney Island and Brooklyn. The fuel cost for the boat, incidentally, is less than the operating cost for an equivalent number of trucks.

Amphibious Loads Also Travel by Truck

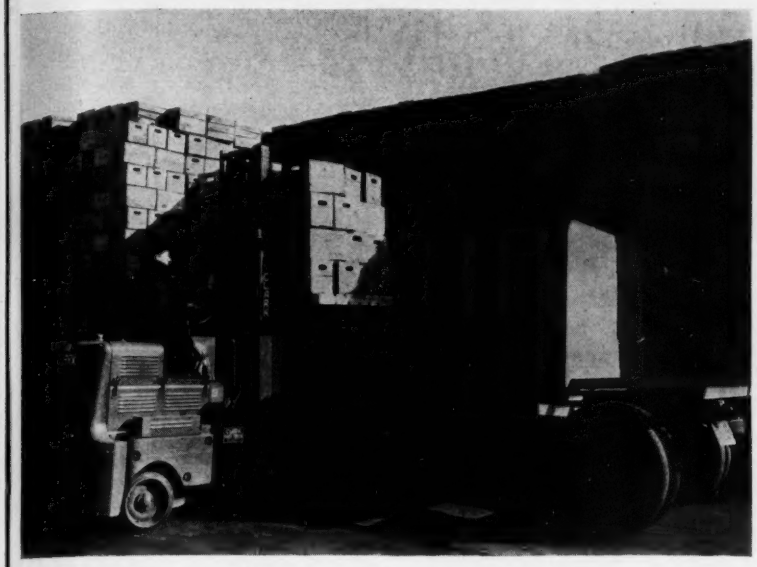
As the double pallet loads are unloaded from Big Bottle at the receiving point, the individual pallet-



Ford truck moves load of empties, received from boat, to production line in bottling plant.

ized units may be transferred directly to the company's local or retail delivery trucks by fork truck, thus avoiding extra handling. This special type of delivery truck, designed and perfected by company

engineers, is an adaptation of a bus chassis equipped with a pusher-type drive. The vehicle can receive four



This is new type of retail delivery truck with low-slung chassis. It receives 4 pallet loads.

loads, two on each side, or 200 cases. The chassis is so designed that the top case can be conveniently reached from the street.

As indicated in earlier paragraphs, the palletized loads are also hauled by the larger trailers serving the inland warehouses. These trailers are eight feet wide, whereas the width of the smaller trucks operated by distributors averages about 6½ feet. To realize the full benefits of palletization, it was desirable to have a pallet of a size which would fit both on the narrower distributor trucks as well as on the wider trailers operated by the company, without loss of load capacity. The size of the distributors' vehicles limited the pallet width to 36".

But this would have meant losing load capacity on the trailers—about 400 cases per load instead of 500, or a loss of 100 cases per load. This is how company engineers devised the solution. One row of pallets is spotted lengthwise, the other row crosswise to the trailer. While this provided a full capacity load of 500 cases per trailer, there was no room for entry of truck forks on the pallets that were placed sideways. This handicap was overcome by nailing 2"x4" pieces on that particular side of the trailers. These permanent stringers provide the necessary clearance for the forks.

Another practice is noteworthy in connection with the loading of the trailers used for inland deliveries. Empty pallets are placed on the trailer, which is backed up near the end point of a conveyor line moving out full cases from the plant. These cases are then routed over telescopic conveyor sections which have been set up on the trailer beds. In this way the cases are palletized directly on the trailers.

Coordinated Handling

The palletization program of the Pepsi-Cola Company's Long Island plant has been of far-reaching significance, both as it concerns the Big Bottle and the inland warehouse and retail deliveries. In fact, the new program has been part of a greatly improved distribution method. Instead of delivering (unpalletized) cases to individual distributors, as formerly, the latter are now grouped and supplied by a few main warehouses. And when the cases had been unloaded at the distributors, it was again necessary to load them on his trucks—case by case.

Today, 50 cases are moved off the trailers at one time, requiring a fraction of the time it took previously. Today, the driver merely drops his trailer at the warehouse and returns immediately with the empty trailer which brought in the previous load. He no longer has to worry about unloading—which is done by fork truck. And the distributor's truck is loaded in little more time than it takes to say Pepsi-Cola.

Thus the economy factors in terms of reduced loading and unloading time loom as an important consideration, along with the improved distribution method. Another noteworthy advantage has been the reduction in breakage, also a result of the elimination of individual case handling. And the same size pallet is used for deck loading as well as for all trucks.

Full cases coming off line are palletized directly on trailers, avoiding respotting of the loads.

Material Handling the KEY to

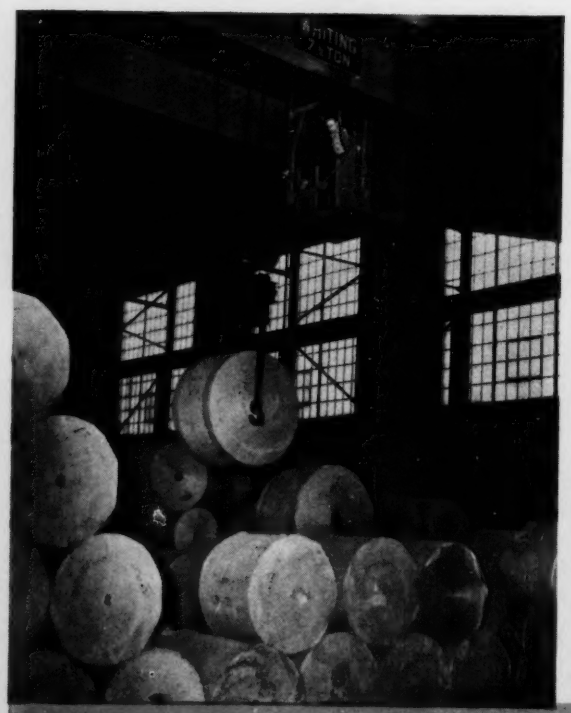
ONE of the distinguishing features of the handling operations at the Chicago Carton Company, Chicago, is the movement of the material on skids—from initial processing through production, finishing, packing and shipping. Modern handling methods *coordinated* with efficient plant layout is the key to low handling costs and a smooth work flow. Noteworthy also are certain layout provisions and a crane installation, both designed as aids in moving heavy loads with minimum effort and manpower. A specially designed crane grapple, for example, eliminates the necessity of using a crane follower, and the flow of material from the first to the second floor (of the two-story building) is via a ramp. Another feature is the scrap paper disposal by means of gravity chutes that lead from the second-floor stripping department to the basement.

The Chicago Carton Company manufactures folding paper boxes that are used for packaging butter, ice cream, lard, margarine, cereals, crackers, and numerous other types of products. The raw material—millboard and paper—is received both in roll form and in flat sheets. The rolls are handled by an overhead traveling crane that serves the roll paper storage department. The strapped skid loads of flat stock are moved from the cars by high-lift platform trucks into the storage area, where the material is double decked.

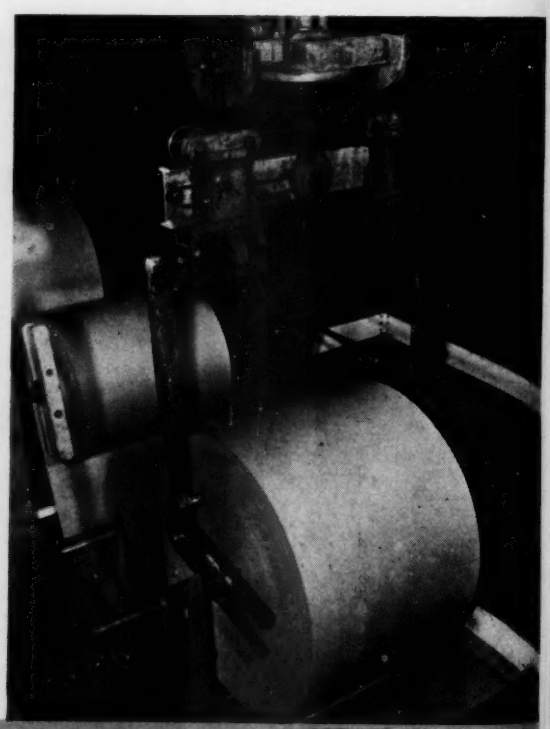
Crane With Specially Designed Grapple

Rail sidings and truck docks, both for receiving and shipping, are within the building, thus preventing any of the material from being exposed to the weather. The plant layout also provides for short moves and straight flow of the material. The receiving point for stock in roll form, for example, is in an area that is immediately adjacent to the raw paper stock piles. The rolls of mill board, weighing up to 4,000 lbs. each, arrive in a horizontal position in freight cars and are rolled out on the receiving floor.

From here—and until the material is fed into the laminating and treating machines—the movement



Versatile crane grapple in action. Here it is removing unshafted rolls from storage, using lugs.



Here, by means of hooks, crane has just deposited shafted roll on stand. Note lugs and hooks.

coordinated with plant layout . . . . . to EFFICIENCY

of the heavy rolls is entirely by crane. The operator in the cab-controlled unit is about 30 feet above the floor, but he does not need a crane follower when picking up or depositing the rolls.

As shown in the photos, the grapple is equipped both with lugs (for picking up roll stock) and also with hooks (for handling shafts and shafted rolls). The crane arms are adjustable sideways electrically. The operator lowers the grapple over a roll, and as the arms move toward each other the lugs are inserted in the core. After the rolls are deposited by the crane on the designated stock piles, the crane operator disengages the grapple simply by moving the arms out. The individual rolls are nested and stacked to a height of about 20 feet. (The layer on the floor is blocked by heavy chock blocks.)

The crane also moves the rolls to the first processing operation, which adjoins the storage area at the end opposite to the receiving point. The first processing step consists of laminating and treating, which is performed in order to produce box-board with moisture-proof and grease-proof qualities.

By means of the lugs on the grapple, the crane picks up the rolls from the stock piles and transports them to the feed end of the laminating machines, a mezzanine section. The rolls are deposited on this elevated deck. After the shafts have been inserted, the crane handles the rolls by means of its other attachment—the hooks at the end of the grapple. In this way, without the aid of a crane follower, the shafted material is placed on the stands of the laminating machines.

Thus the handling of many thousands of tons of roll stock—from receiving to storage and from storage to processing—has been made a simple, one-man operation. The grapple, specially designed to the requirements of the Chicago Carton Company, enables the crane operator to move a mountain of material and position the rolls as needed for processing. The crane similarly serves the slitting machines.

At the feed ends of the laminating machines, incidentally, two roll stands are available for each ply of laminating material. When one roll has been consumed, the second roll is immediately ready to be threaded into the machine. In this way an operation with minimum interruption is assured.

The Skidded Loads

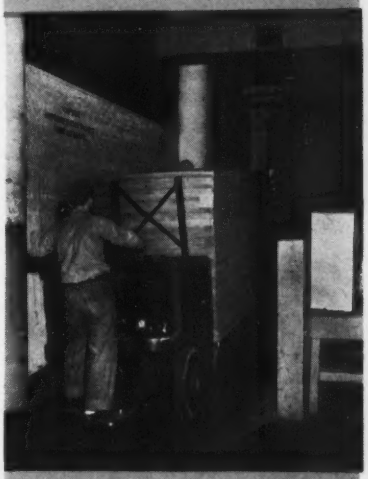
The roll stock comes off the laminating machines cut in sheets of the desired size for printing and subsequent operations. At the discharge end, the board is deposited by the cutters on skids.

Powered platform trucks transport the individual loads to the second-floor printing department via the ramp which has been previously mentioned. This ramp, designed for the quick movement of the loads to the desired locations, makes three right angle turns from the first floor to the second floor.

The loads of laminated and treated stock are positioned at the printing presses, and the individual skid loads are then hoisted on the machines. At the discharge end, the material is again a solid skid load, which is then moved as a unit to the next operation.

As shown in one of the photos, the movement of the work in process is by powered hand lift truck from one operation to the next. Loads weighing up to 3,000 lbs. are

High-lift truck double decks flat raw stock in storage. Overhead space is thus well utilized.



Skid load of laminated stock being moved to the second-floor printing department via the ramp.

After printing, and until shipping, material remains a skidded load. Transfer is by powered hand truck.

thus speedily and easily transferred from one press to another, or from a press to the die cutting depart-

Motorized hand truck will move loads to next operation.

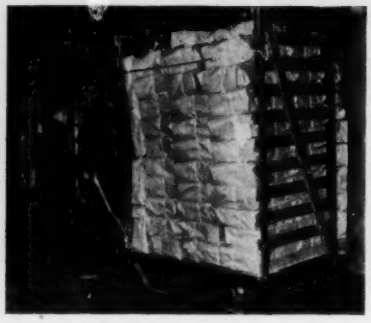
ment. The use of these motorized hand lift trucks has relieved the larger units of the company's truck fleet for hauling jobs involving longer moves.

The handling of the loads in the die cutting department is similar to that in the press department—that is, the work remains on skids and in this manner keeps advancing to the next operation. One of the photos shows several loads positioned on the feed end of die cutting machines. Note that they are hoisted on inclined runways formed by planks and angle iron guides. This inclined position facilitates the feeding of the relatively heavy material into the machines.

From the die cutting operation, powered hand lift trucks transport the loads to the stripping tables where the scrap is removed. (See section immediately following for the scrap handling method used.) The stacks of (flat) cartons are then moved to the nearby wrapping and packing department.

As in the case of the raw material and the work in process, special provisions are made wherever possible for moving the finished and wrapped products in large units and with the least effort. An example is the high gated skids which are used for cartons that are tied in bundles. (A portion of the material is shipped in corrugated containers, and some bulk loads are bound with ½-inch strapping.) The bundled material, however, represents a considerable proportion of the total volume shipped from the plant.

The gate sections are inserted in the cups at the two ends of the skid. With a height of about 6½ feet, these gates permit the individual loads to be built to a considerable height. Large loads are



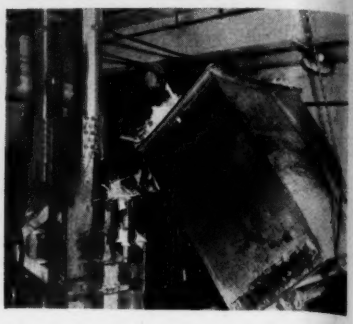
High-gated skid used for piling bundles of finished product. These are ready to go.

thus provided for movement to the shipping department, and the arrangement is also a space-saving feature in the wrapping and shipping departments. The loads are moved by powered hand lift trucks to storage or shipping.

Efficient Waste Removal

The stacks of printed and die-cut sheets are laid on stripping tables, where operators remove the scrap. As can be seen from one of the photos, these tables are positioned alongside openings in the floor, through which the paper scrap drops via chutes directly into metal trucks in the baling department. These receptacles, mounted on wheels, are fairly large—about 6 feet high, 3 feet wide and 4 feet long. Their large capacity does not require them to be emptied frequently.

When a truck is full it is pushed to the nearby baler, where the dis a chain fall. Two hooks, attached charging operation is facilitated by



Efficient scrap paper disposal. From stripping table scrap drops through floor opening

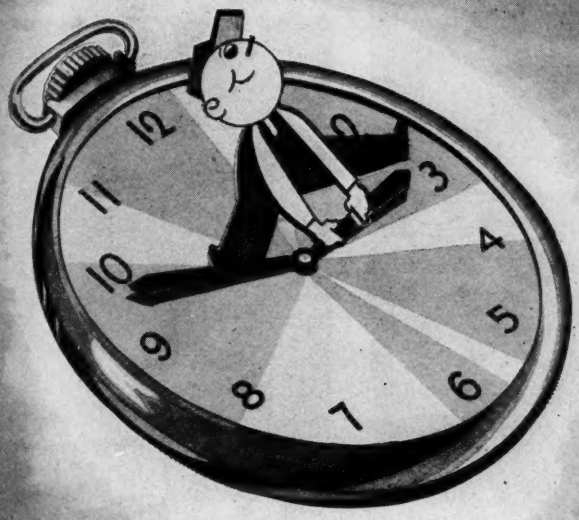
to the end of the chain fall, are inserted into openings in the base of the truck. The electrically operated chain fall then lifts and tips the metal container, spilling the contents into the baler.

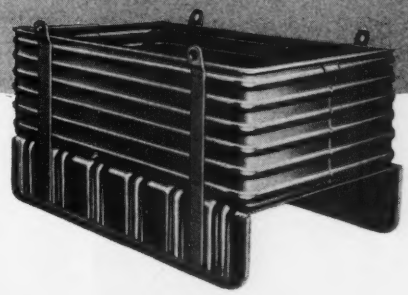
Mechanically Speaking

This work is performed at the Chicago Carton Co. by a 7½-ton crane, with an 80-foot span and a versatile grapple designed to carry any size roll of paper. As mentioned in the article, the parallel-opening grappling arms are of particular interest. The grapple has a separate motor for turning the arms to any desired position and another motor for manipulating the arms to suit different widths. All movements are controlled by one man from the crane cab.

Chain fall lifts and tilts full trucks, discharging scrap paper conveniently into the baler.

TO SAVE TIME in Materials Handling

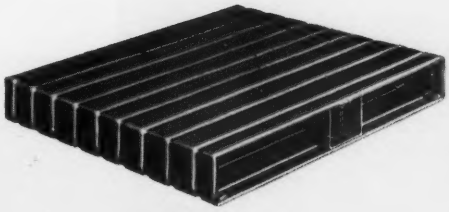




Equip with steel SKIDS, BOXES, PALLETS
***Engineered* by Union Metal**

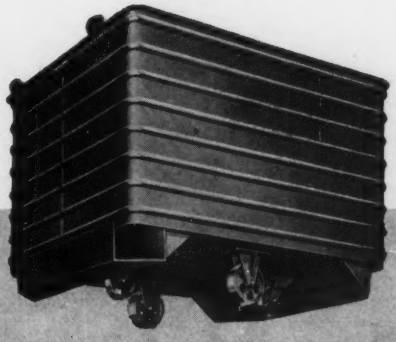
JOB proved in thousands of busy plants in practically every industry, Union Metal's broad line of materials handling units . . .

★ ***SAVE TIME***
★ ***SPEED PRODUCTION***
★ ***CUT COSTS***

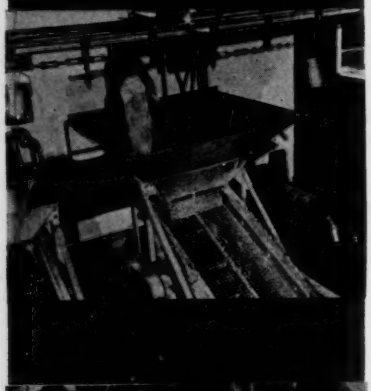


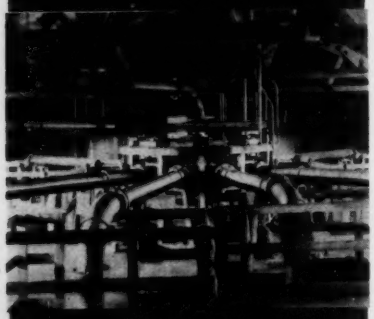
. . . because they're *engineered for their job.* Light in weight, easy to handle, long-lasting. They help keep floor space clear for production . . . permit you to handle almost any material or product in unit loads.

Standard designs to meet most requirements. Special designs for special problems. For complete information, write The Union Metal Mfg. Co., Canton 5, Ohio.



UNION METAL
Materials Handling Equipment





Goodbye, Messy

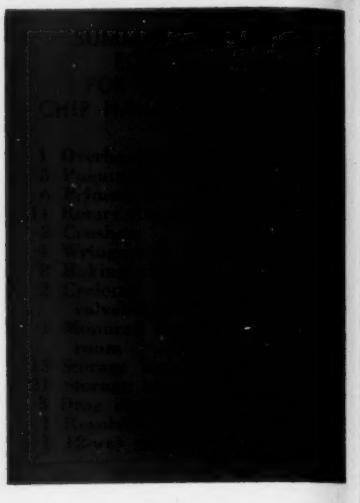
BY SIDNEY REIBEL,

Materials Handling Specialist
Albert Kahn Associated Architects and Engineers, Inc.

This installation, one of the largest aluminum chip handling systems ever built, paid for itself in the first six months of operation. This was done not only by reducing former handling costs but also by increasing the value of the chips.

The layout of the chip handling and storage system, and the design of special equipment were prepared by Albert Kahn Associated Architects and Engineers, Inc., under the direction of the writer.

ALUMINUM chips at the Pratt and Whitney Aircraft Corporation plant at Kansas City, Missouri, amounted each month to more than three and one-half million pounds, which will fill 67 box cars. (Imagine how many aircraft engines they produced!)



When the chips were processed they were worth several cents per pound more than when unprocessed. The savings were greater than just the difference in the pound price due to high percentages (often up to 25 to 30%) deducted by scrap dealers for contamination and moisture content in unprocessed chips. Prices varied, but at five cents per pound, these chips were worth more than $2,000,000 per year. An increase of one cent per pound would add $400,000, which was well worth going after.

The flow diagram indicates how two separate units were used to process the chips and deliver them to the storage bins. Unit No. 1 had a capacity of 1,250,000 pounds per month based on eight hours per day operation. The monthly capacity of Unit No. 2 was 2,225,000 pounds per 24-hour day.

Unit No. 1 for Alloy Chips

All of the aluminum alloys, except cylinder head chips, were collected in the manufacturing areas in separate steel barrels or drums, and transported to the chip room by powered lift trucks. Here they were examined at raking plates, crushed, and delivered to the wringers by a *wet chip* pneumatic conveyor. After they were dried in

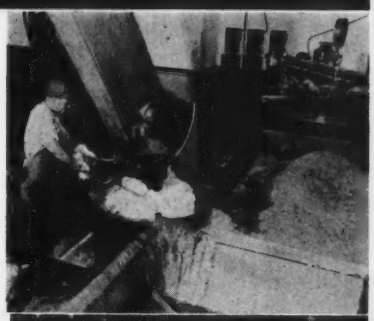
the centrifugal chip wringers, the chips were delivered from the chip room to storage bins 700 feet away, by a *dry chip* conveyor.

Twelve Way Valve: At the end of the dry chip conveyor, a twelve-way, especially designed for this installation, was located at the top of the storage bins. This valve was controlled by push button from the chip room, and was designed to avoid delays in handling small batches of different alloys which had to be kept segregated. In a few seconds, this valve could be switched to discharge into any one of the storage bins numbered 1 to 12 inclusive. The valve had controls which insured proper alignment, prevented the mixing of chips in transit, and prevented the sending of chips to full bins.

Unit No. 2 for Cylinder Head Chips

Although only one alloy was handled by Unit No. 2, it equaled two-thirds of the total weight of all the aluminum chips. They came from the cylinder head machining department which covered over 100,000 sq. ft., with ¾ mile of aisles lined on both sides by machines. Down the center of this aisle ran a 4,600-foot-long overhead trolley conveyor on which each operator hung small bucket loads of chips from his machine. This conveyor delivered loaded buckets to the chip room and returned empty buckets for reuse. It saved 20 men per shift or 480 manhours per day.

The chips were dumped in the chip room on to a vibrating screen where 90 percent passed through and entered another *wet chip* pneumatic conveyor. Oversize material was examined on raking plates, crushed and then entered this wet chip conveyor. From this point on, chips in Unit No. 2 were handled and delivered to the top of storage bin No. 13, in the same manner as in Unit No. 1.



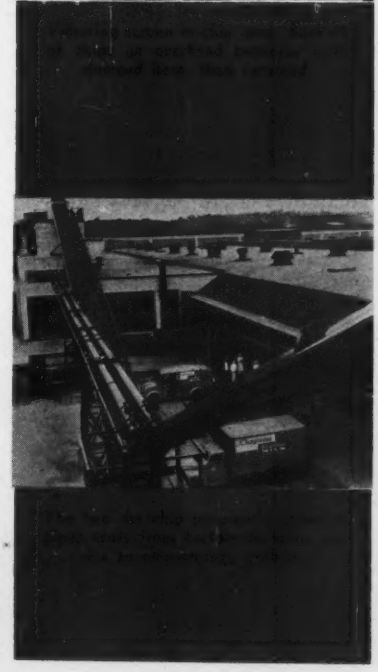
Revolving Distributor: A specially designed revolving elbow was located at the center of bin No. 13. As it slowly revolved, the chips were blown over the whole area of the 40 foot square bin. In this manner the bin could be completely filled level full to the farthest corners.

The 13 bins had a total storage capacity of 23 car loads of chips. Each of bins No. 1 to 12 had a single discharge gate. Bin No. 13 had 9 gates.

Car Loading Equipment

The chips could be withdrawn through the bin gates to the three drag chain conveyors, interlocked so that only one conveyor could be operated at a time. The drag conveyors fed the chips to a pneumatic car loading conveyor which could deliver either to box cars or trucks. This conveyor loaded box cars easily and to maximum capacity.

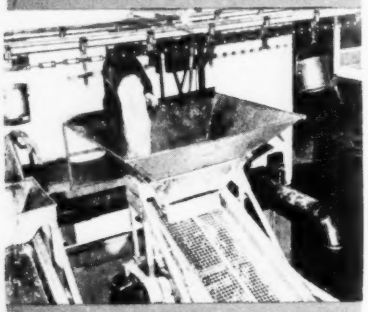
Manual loading of box cars before this system was installed was at a rate of less than 1,000 pounds per man hour. With the car loading system in use, the rate was 30,000 pounds per man hour, and one man could load three box cars to maximum capacity in eight hours.



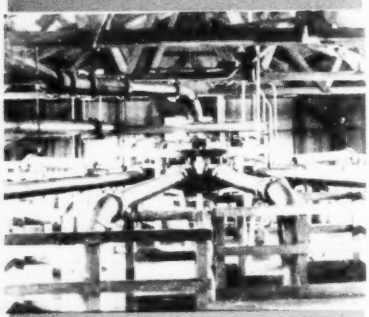
Goodbye, Messy

BY SIDNEY REIBEL,
Materials Handling Specialist
Albert Kahn Associated Architects and Engineers, Inc.

Dumping a drum of alloy chips into a crusher. Note raking plate.



Wringer bucket being filled with wet chips withdrawn through spout from overhead cyclone.



The heart of Unit No. 1—A 12-way selector valve at top of storage bins, remote-controlled.

This installation, one of the largest aluminum chip handling systems ever built, paid for itself in the first six months of operation. This was done not only by reducing former handling costs but also by increasing the value of the chips.

The layout of the chip handling and storage system, and the design of special equipment were prepared by Albert Kahn Associated Architects and Engineers, Inc., under the direction of the writer.

ALUMINUM chips at the Pratt and Whitney Aircraft Corporation plant at Kansas City, Missouri, amounted each month to more than three and one-half million pounds, which will fill 67 box cars. (Imagine how many aircraft engines they produced!)

SUMMARY LIST OF EQUIPMENT FOR THIS LARGE CHIP HANDLING SYSTEM

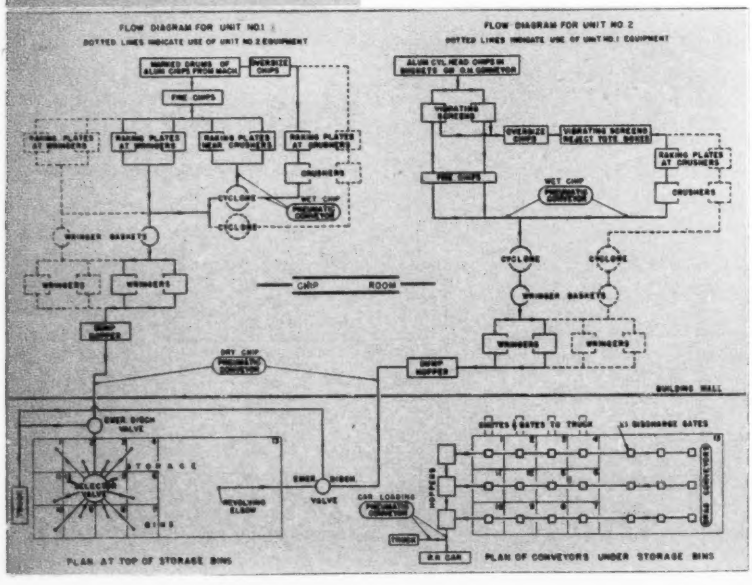
- 1 Overhead Conveyor
- 5 Pneumatic Conveyors
- 6 Primary Feeders
- 11 Rotary Air Locks
- 2 Crushers
- 4 Wringers
- 8 Raking plates
- 2 Cyclone receivers with revolvable spouts
- 1 Monorail system in the chip room
- 13 Storage bins
- 21 Storage bin gates and spouts
- 3 Drag chain conveyors
- 1 Revolving distributor
- 1 12-way valve

When the chips were processed they were worth several cents per pound more than when unprocessed. The savings were greater than just the difference in the pound price due to high percentages (often up to 25 to 30%) deducted by scrap dealers for contamination and moisture content in unprocessed chips. Prices varied, but at five cents per pound these chips were worth more than $2,000,000 per year. An increase of one cent per pound would add $400,000, which was well worth going after.

The flow diagram indicates how two separate units were used to process the chips and deliver them to the storage bins. Unit No. 1 had a capacity of 1,250,000 pounds per month based on eight hours per day operation. The monthly capacity of Unit No. 2 was 2,225,000 pounds per 24-hour day.

Unit No. 1 for Alloy Chips

All of the aluminum alloys, except cylinder head chips, were collected in the manufacturing areas in separate steel barrels or drums and transported to the chip room by powered lift trucks. Here they were examined at raking plates, crushed, and delivered to the wringers by a *wet chip* pneumatic conveyor. After they were dried in


FLOW DIAGRAM FOR UNIT NO. 1
DOTTED LINES INDICATE USE OF UNIT NO. 2 EQUIPMENT
FLOW DIAGRAM FOR UNIT NO. 2
DOTTED LINES INDICATE USE OF UNIT NO. 1 EQUIPMENT
CHIP ROOM
BUILDING WALL
PLAN AT TOP OF STORAGE BINS
PLAN OF CONVEYORS UNDER STORAGE BINS

Chips

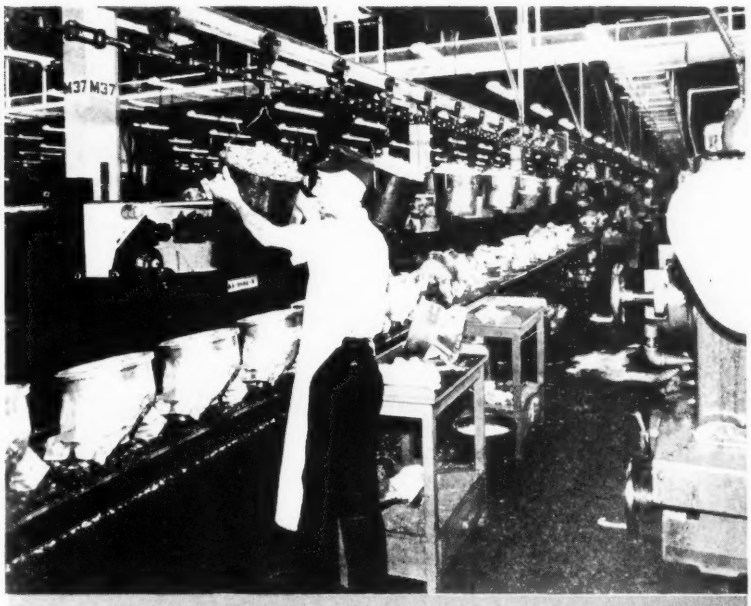
the centrifugal chip wringers, the chips were delivered from the chip room to storage bins 700 feet away, by a *dry chip* conveyor.

Twelve Way Valve: At the end of the dry chip conveyor, a twelve-way, especially designed for this installation, was located at the top of the storage bins. This valve was controlled by push button from the chip room, and was designed to avoid delays in handling small batches of different alloys which had to be kept segregated. In a few seconds, this valve could be switched to discharge into any one of the storage bins numbered 1 to 12 inclusive. The valve had controls which insured proper alignment, prevented the mixing of chips in transit, and prevented the sending of chips to full bins.

Unit No. 2 for Cylinder Head Chips

Although only one alloy was handled by Unit No. 2, it equaled two-thirds of the total weight of all the aluminum chips. They came from the cylinder head machining department which covered over 100,000 sq. ft., with $\frac{3}{4}$ mile of aisles lined on both sides by machines. Down the center of this aisle ran a 4,600-foot-long overhead trolley conveyor on which each operator hung small bucket loads of chips from his machine. This conveyor delivered loaded buckets to the chip room and returned empty buckets for reuse. It saved 20 men per shift or 480 manhours per day.

The chips were dumped in the chip room on to a vibrating screen where 90 percent passed through and entered another *wet chip* pneumatic conveyor. Oversize material was examined on raking plates, crushed and then entered this wet chip conveyor. From this point on, chips in Unit No. 2 were handled and delivered to the top of storage bin No. 13, in the same manner as in Unit No. 1.



Chips transported in buckets from cylinder-head dept. to chip room, via overhead conveyor, 4,600 feet long, one of the largest installations of its kind.

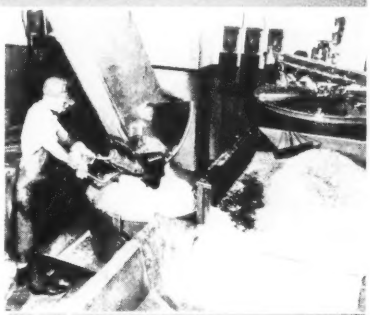
Revolving Distributor: A specially designed revolving elbow was located at the center of bin No. 13. As it slowly revolved, the chips were blown over the whole area of the 40 foot square bin. In this manner the bin could be completely filled level full to the farthest corners.

The 13 bins had a total storage capacity of 23 car loads of chips. Each of bins No. 1 to 12 had a single discharge gate. Bin No. 13 had 9 gates.

Car Loading Equipment

The chips could be withdrawn through the bin gates to the three drag chain conveyors, interlocked so that only one conveyor could be operated at a time. The drag conveyors fed the chips to a pneumatic car loading conveyor which could deliver either to box cars or trucks. This conveyor loaded box cars easily and to maximum capacity.

Manual loading of box cars before this system was installed was at a rate of less than 1,000 pounds per man hour. With the car loading system in use, the rate was 30,000 pounds per man hour, and one man could load three box cars to maximum capacity in eight hours.



Vibrating screen in chip room. Buckets of chips on overhead conveyor were dumped here, then returned.

The two dry chip pneumatic conveyor pipes cross from factory building and rise to chip-storage building.

Car unloader and flight conveyor take coal out of pit under rails and discharge it into truck.

The modern coal and building supply yards have abandoned the pick-and-shovel method for mechanized car unloaders and loading equipment. The speedy and economical handling it provides enables smaller companies to meet competition.

MINING, preparation, and delivery of bulk materials, such as gravel and coal, are essentially handling operations, and until they reach their destination as raw materials or fuel they may be handled by many types of mechanical handling devices. In order to keep costs down, they must likewise be handled according to modern, economical methods at the supply yards located at focal points of distribution. The track hoppers and the overhead handling equipment that do an efficient handling job in the large yards, where the volume handled is thousands of tons per day, cannot be economically employed by the small or medium size distributor. Nevertheless, he handles the same type of bulk material, and must do it economically if he is to keep costs in line and meet competition.

Standard devices are now available that help to keep bulk material handling costs down—car unloaders, flight conveyors, and portable bucket elevators. These discussed in this article, do away with the old, slow and costly method of material handling by pick and shovel.

A Flexible Operation

One of the features of the car unloader is that it eliminates the need for the track hopper (suitable for the larger yards). It makes possible car unloading anywhere a car may be spotted. Depending upon the design, it may be used over the rails or in a pit. At the yard of the Goff-Kirby Co., Cleveland, the car unloader is used in pits located at points beneath the slightly elevated tracks for incoming rail cars. A car jack is used to inch the coal cars into position over the pits if the yard engine has not already done so. The part of the car unloader which extends beneath the car (over the bottom of the pit) is long enough so that it will swing free between the ends when the car door is dropped. This flat part of the unloader extends far enough to receive all of the coal dropped from the widest standard railroad car.

The inclined track and frame which supports the continuous carrying surface of the car unloader

(Turn to page 47)

Another view of unloader and conveyor shows spout through which screened coal dust drops.

Here foot end of car unloader is placed over the rails and receives coal as car doors open.

STACKED, STRAPPED AND EASY TO SHIP

With Stanley Steel Strapping

Here's a perfect example of how Stanley Steel Strapping converts a headache into a snap. Coils of strip steel... slippery, heavy and sharp-edged... the kind of thing that can really cut loose in shipment. Stanley Steel Strapping lashes these coils to a pallet, locks them into one rigid unit and wastes no time or material on the job. That's one of the many advantages of Stanley Steel Strapping ... it makes the product make its own package.

The Stanley Steel Strapping System includes tools, reels and accessories.

The Stanley Works, Steel Strapping Division, New Britain, Connecticut

STANLEY

Trade Mark

STEEL STRAPPING AND CAR BANDING SYSTEMS

Make April a model for all months—"PERFECT SHIPPING MONTH"

One tractor pushes and the other pulls when handling the larger assembled machines, as shown below.

WHEN YOU CAN'T PUT IT ON WHEELS...

Push and Pull

Tractors provide the "push and pull" in this low-headroom manufacturing plant. Units weighing up to 70,000 lbs. are handled by various on-the-floor and overhead devices in a flexible operation.

THE "push and pull" method of moving heavy materials has been the answer to the handling problems of the National Acme Co., Cleveland, where screw and other machines weighing up to 70,000 pounds are manufactured.

Because there is insufficient headroom in the plant for large overhead traveling cranes, track-type tractors and load carriers are coordinated with five-ton cranes in moving the heavy subassemblies and finished machines. The tractors, with rubber shoes, are equipped with front and rear end steel "bucking plates" for the pushing operations. They also nose the pieces into position at work stations.

In the manufacture of single and multiple spindle automatic bar machines and chucking machines, heavy castings are assembled to make up the frames. The four heavy members of a frame consist of a pan, headstock, gear box and top plate. Individual pans vary in weight from 3500 to 7200 lbs.; headstocks, from 1200 to 3200 lbs.; gear boxes, from 1300 to 4700 lbs.; and top plates, from 450 to 2000 lbs. These large castings constitute a sturdy box-type frame which is designed to prevent vibration that would interfere with accurate machining operations. From the weight of the frame alone, it can be seen why the machine, when complete and ready for shipment, will have a total weight of from 10,500 lbs. to 70,000 lbs.

The flooring, to withstand the "push and pull" of these "heavyweights," consists of 3-inch wood blocks which have been tarred in over a cement base. Some of these blocks, particularly in the aisles, have been shaved down to a half inch, but replacements have been few and the cost of floor maintenance is a negligible factor. Blocks, installed as far back as 10 to 15 years ago, are still in the building. The floors are oiled, but are not slippery, and workmen have a secure footing when walking about in

To Storage and Shop

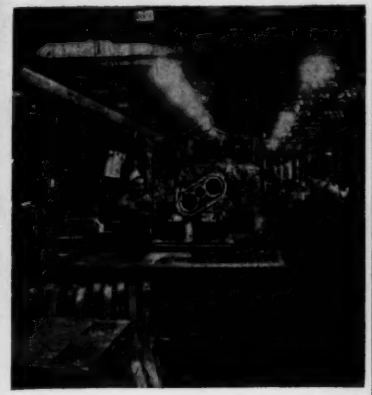
Castings arrive on highway trucks in one end of the building beneath the span of a five-ton overhead crane, which tiers the material on the floor. Headstocks and gear boxes are double tiered, while pans and other parts may be tiered three to six high, according to the nature of the product. Tractors equipped with bucking plates then skid the

Tractor with bucking plates pushes load of tiered pans, 13,500 lbs., into storage area.

Steel shoe prevents pan from snagging floor blocks as it is hauled to assembly station.

tiered loads across the floor into the storage area.

When needed, the loads are pushed under the span of a crane.



Overhead crane enables milling machine operators to position heavy gear boxes.

The castings are picked up and placed in millers, planers, boring machines, etc., and upon completion of these operations are again moved by crane. The gear boxes, headstocks and top braces are transported over the relatively long distance from the machining area to the assembly line by load carrier (rigid, platform-type truck). The reason is that the dimensions of these pieces are such that they have a tendency to tip when being pushed at a fast rate of speed. Because of their weight and size, pans are placed on the floor and a steel shoe is inserted under the front end. These shoes are curved steel bars, about 18 inches in length.

Top brace is set into milling machine by use of powered, pendant-controlled hoist.

They hold the front of the pan about one inch above the floor. This protects the wood blocks from be-

(Turn to page 44)

CLARK *Electric*

battery powered

FORK TRUCKS

Priced on Basis of Clark Volume Production

Lifts

Carries

Tiers

Write for VEST POCKET CATALOG

CLARK TRUCTRACTOR

Division of CLARK EQUIPMENT COMPANY

BATTLE CREEK, MICHIGAN

OTHER PLANTS — BUCHANAN, JACKSON, BERRIEN SPRINGS, MICHIGAN

Products of CLARK • TRANSMISSIONS • ELECTRIC STEEL CASTINGS AXLES FOR TRUCKS AND BUSES • AXLE HOUSINGS • BLIND RIVETS INDUSTRIAL TRUCKS AND TRACTORS • HIGH-SPEED DRILLS AND REAMERS METAL SPOKE WHEELS • GEARS AND FORGINGS • RAILWAY TRUCKS

On this metal slat conveyor travel sides trimmed for bacon—first step after pork emerges from chilling room.

BRING HOME T

Modern handling methods and a good deal of processing are necessary to turn that rough piece of pork belly into the bacon you bring home. Here is how Swift & Company, Chicago, handles its top grade of this product, from final trimming to shipping.

THIS story starts approximately where the meat packing house's much-publicized production line ends. That is, at some point beyond the overhead track on which the hog carcasses travel through numerous cleansing, trimming and U. S. government meat inspection stations, to the cooling room. The reason for by-passing these initial operations is largely that many interesting handling devices and methods are employed in the preparation of certain cuts that travel by other means.

Swift's Premium Bacon, for example. A good many moves and handling operations are involved before that cut of the hog becomes a neatly packaged pound of sliced bacon.

The Raw Product Becomes Bacon

Our story takes up after chilling —in fact, after the loins, spare ribs, etc., have been trimmed by skilled hands wielding specialized cutting tools. The chilled sides trimmed for bacon travel on the type of metal slat conveyor shown in one of the photos on the opening pages. Operators are stationed at both sides of the line.

They cut away the side strap, and the fat back, brisket and boot jack ends, each part being routed to its individual processing department (frequently by gravity

After cure: Bacon is transferred to metal tank truck. It is hauled by tractor to hanging room, photo shown at left.

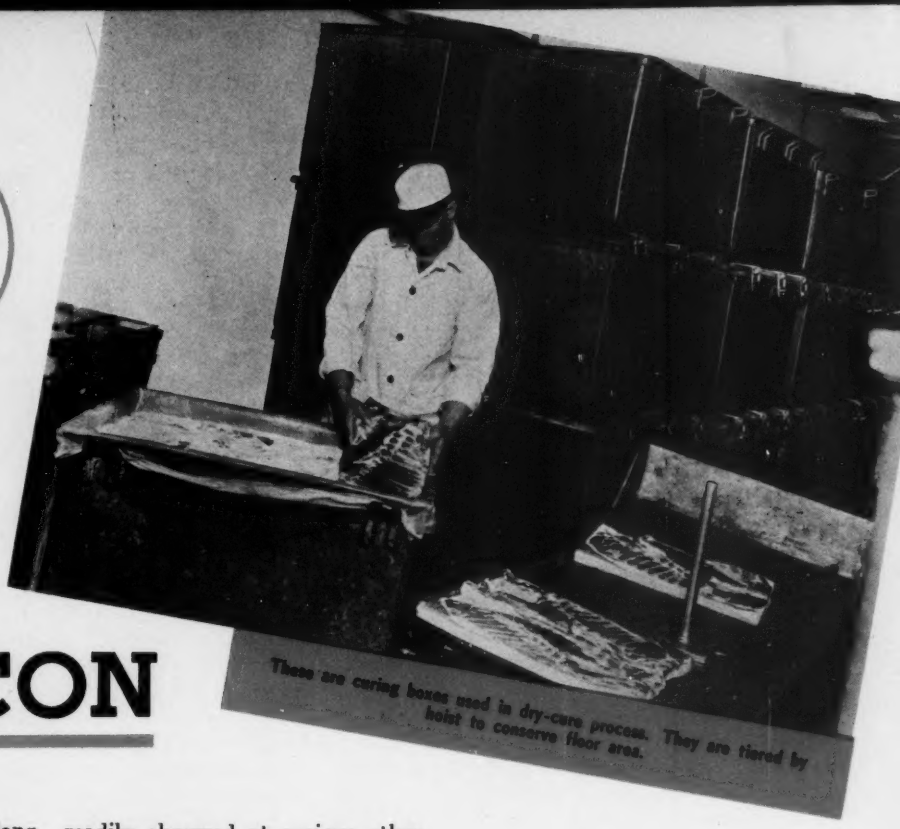
These are bacon trees in Swift & Co.'s smoke house, photo at right; they transfer product to the cooling room.

Efficient Handling

a must before

you can

M THE BACON



These are curing boxes used in dry-cure process. They are tiered by hoist to conserve floor area.

chute). It's the lean-and-fat oblong slabs that remain—about 60 per cent of the rough belly—that become the best grade of the company's bacon.

Spotted beside the conveyor line are metal hand trucks, on which the sides of premium grade are segregated. The loaded trucks are moved to the nearby curing room. While minor or less expensive cuts may be routed via chutes to work stations located on lower levels, the choicer grades are handled with special care. This precaution, characteristic of the over-all handling and processing method, can be readily observed at various other points along the line. And this care in handling—whether by manual or mechanical means—is designed to provide a high-grade product of uniform quality.

The galvanized metal curing boxes, also shown in the photos, have a capacity of approximately 700 pounds each. These boxes, by the way, are used for the dry curing process, the method concerned in this description. (The choicest grades of bacon are dry cured.) The individual boxes are positioned on a stand, which provides underclearance for lift trucks.

After the sides have been packed down in a box with the necessary curing agents, the cover is clamped on. The loaded container is then moved by powered truck to the assigned location, where it is stacked two or three high by means of electric hoists on monorails. We now leave the product to cure in its own juices—literally—where it begins to develop the flavor that makes Americans hasten to the breakfast table.

After the proper curing time has

Conveyorized wrapping line for slab bacon, right. Wooden blocks permit tying with minimum handling. By means of efficient handling methods and modern devices, large volume is produced with minimum handling. Advanced methods are also illustrated on following page.

elapsed, the boxes are again positioned for convenient handling by the operator. As shown in one of

Slices of Premium Bacon are delivered on this metal conveyor to the wrapping operators.

the photos, the cured pieces are next transferred to a metal tank truck which has a capacity of about one ton. These trucks are hauled by industrial tractor to the meat hanging room. Here, after certain operations which include electric branding, a metal comb hanger is inserted at one end of the slab. This is then hung on a bacon tree. The latter consists of two rectangular steel frames, notched at the top, which are attached to a vertical member, that is suspended from trolleys running on an overhead track. A single tree arm, or section, holds approximately 750 pounds of bacon. These units are moved into the smoke house, where the cured meat is given a long smoke produced by hardwood and hardwood sawdust. The finished, nut-brown bacon is returned to the hanging room for cooling.

Handling of Slabs and Slices

If the bacon is to be wrapped and sold in slab form, the product is transported on the tree to the wrapping and packing department located on the same floor. After a final inspection at this point, the sides move over a powered belt conveyor to the wrappers stationed along the line. The wrapped bacon is redeposited on the belt, which moves the product to the scale located at the end point. The weighed pieces are deposited either in shipping boxes or laid flat on shelf trucks. The material on the trucks is moved to the shipping coolers.

A certain phase of handling slab bacon at this point is noteworthy —small details that simplify the operation and are an aid to production. They also exemplify the previously mentioned careful handling. From one of the photographs it can be seen that each operator wraps the piece while it is laid over a flat wooden block. This slight elevation allows the girl to pass the cord around the package without turning or manipulating the product, thus again avoiding unnecessary handling. A seemingly minor detail, it definitely contributes to the uniform and appetizing appearance of the bacon.

If the bacon is to be sliced, the pieces are first chilled and mechanically pressed, then transferred in metal tank trucks to the slicing department located on another floor. The specially developed slicing machines are automatic and feed six sides through the cutters at one time. Another feature of this equipment is designed as an aid to

This special elevator, 28 feet long, overcomes building handicaps due to different floor levels.

weighing and packing—and, again, to minimum handling. The feature is that the slicing machines can be set to space the slices dropping off at the discharge end into one-half pound or one-pound units (or in a continuous "bulk" formation), according to trade requirements.

The slices are discharged onto a stainless steel conveyor, which moves the product to the adjoining wrapping room. Here operators are seated at metal tables, at both sides of the line, and weigh and wrap the bacon. The bacon is lifted off the line after the transparent wrapper has been placed over it. Since the slices come to each operator in separate units of approximately the correct weight, handling of individual slices is held to a minimum. If a unit should contain an extra slice, this is dropped in a metal container attached to the right-hand side of the table. From this supply a slice is also occasionally

Packing the wrapped bacon at end point of line. Hand trucks with wire mesh siding are in rear.

This is the metal slat conveyor used for loading. Products are here transferred to trailer train.

added to a package when necessary.

Incidentally, while the close-up photo shows only one such packaging line, a number of like units are operating in the large room where the sparkling conveyor lines with their white-uniformed operators present a picture of immaculacy in a food handling operation. It is therefore understandable that the route for visitors making a tour of the Swift plant should lead past this appetizing-looking room. Tourists view the operation through a large window. This practice of Swift & Company, it may be pointed out in passing, makes it evident that special handling procedures have a sound public relations or advertising value.

The metal conveyor delivers the wrapped products to a short belt line, from which the packages are removed and placed into shipping containers. The full cartons are stacked on four-wheel flat trucks equipped with woven wire siding, which also serves a purpose. The loaded trucks are moved into the low-temperature holding cooler, where the wire mesh siding gives the refrigerated air access to all the cartons.

Bringing It Home

As orders are received for the bacon—from customers or branch houses—the individual cartons are marked up accordingly, then routed via chute to the loading conveyor. From this conveyor the cases of bacon are loaded into stake-type trailers arranged parallel to the line. When four trailers have been loaded, a tractor hauls the train to the various loading docks.

At this point another feature is noteworthy. In traveling from the loading floor to other buildings, the tractor has to move from higher to lower floor levels. Swift & Company's engineers removed the obstacle from this obstacle course by installing special elevators for moving the whole train, as one unit, to the desired level. Five special elevators of this type, each 28 feet long, have overcome existing building handicaps.

Thus, old-time methods of meat curing are aided by modern methods of material handling, which serve as an important link in the nation-wide mass-distribution of a favorite meat product.

PACKAGED GOODS **HANDLING** LOOSE MATERIALS

IS EASIER AND MORE PROFITABLE WITH . . .

MODERN CONVEYORS BY Farquhar

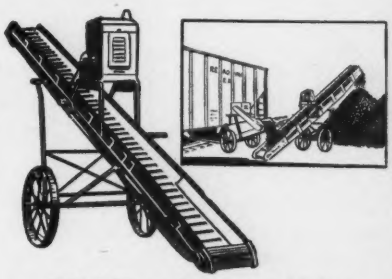
LONG LIFE — LOW MAINTENANCE

Production men know from experience that operating costs go up unless materials handling is carefully watched. That's why so many turn to Farquhar for long life and low maintenance conveyors that mean the easier handling of all types of materials at more profit.

FOR COAL and AGGREGATE HANDLING

The Farquhar Ace, Model 334-3, is a sturdy, time-saver built in ten sizes for handling coal and coke. The Model 334-T is a general utility conveyor for handling coal, sand, gravel, etc. The Portable Car Unloader speeds unloading hopper bottom cars.

ASK FOR DESCRIPTION BULLETINS 334-3, 334-T, 341-342

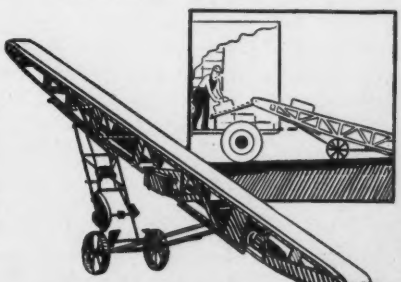


THE ACE and CAR UNLOADER

FOR PACKAGE HANDLING

Model 391 and Model 432, Farquhar Freight Conveyors, have unlimited uses in all industries. Will carry bags, boxes, cases, crates, etc., at speeds to suit requirements and are designed for horizontal or elevating service.

ASK FOR BULLETINS 391 and 432



THE FEATHERWEIGHT FREIGHT

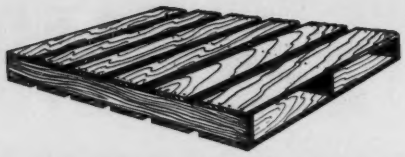
It Pays to Convey the Farquhar Way

PORTABLE OR PERMANENT MATERIAL HANDLING CONVEYORS FOR COAL · COKE · SAND · GRAVEL · BAGS · BOXES · CRATES · CARTONS · BARRELS · ETC.

PORTABLE MACHINERY DIVISION

1856 NINETIETH ANNIVERSARY YEAR A. B. FARQUHAR COMPANY 1946

206 DUKE STREET YORK, PENNSYLVANIA

ON THE  PALLET

NEWS · VIEWS · TRENDS

H. R. 2764, which became law last week, established a legally authorized basis of compensation (supervised by the Interstate Commerce Commission) for freight forwarders' use of motor trucks.

In July 1937, ICC ruled that it had no jurisdiction over freight forwarders and that forwarder-trucker joint rates were illegal. Since that time these services have had an uncertain status. Shippers and consignees in the smaller cities considered them to be vital part of freight forwarder service, necessary to enable them to compete with industries in the large cities.

In May, 1942, Congress passed legislation placing freight forwarders under ICC regulation. Under this Act truckers were authorized to file assembling and distribution rates available to freight forwarders "and others" able to utilize them in conjunction with through carload or truckload movements.

The new system met with delays. Truckers, it appeared, were unwilling to file rates available to all who could use them as part of a through movement, and the bill just passed was drafted to authorize rates only for freight forwarders.

ICC will determine and prescribe at the earliest practicable time reasonable terms and conditions governing agreements between forwarders and common carriers; meanwhile the present joint rates may be continued. The agreements must be filed with the Commission and are subject to its approval.

Thus the new act permits separate and special treatment of forwarders, but it leaves untouched the provisions of the 1942 act. Under it, truckers are authorized to make special rates available to any shippers (or groups of them) who can use the truck services for assembly and distribution in connection with through consolidated movements.

THE Galvin Manufacturing Corp., makers of Motorola radios, originally ordered conveyors to carry dishes to and from the kitchen and cafeteria. Plant engineers witnessed the efficiency of the installation, ordered the conveyors for use in the production lines.

The units at Galvin were made in 90-foot lengths with a flat working surface. This type was used since the product consists of many small parts and must be taken from the conveyor and returned to it many times in its trip down the assembly lines.

Company officials state that the new system has contributed greatly toward enabling the plant to produce radios in excess of the originally scheduled production figures.

"THE business that doesn't know how to handle its materials properly in process won't be here in ten years," said a nationally prominent material handling specialist recently. He added: "There are only three things that can be done to material: it can be mined (or quarried), processed and handled. Handling itself accounts for as high as seventy per cent of the cost of a product. The steel industry handles about twenty-one tons of raw materials for every ton of finished steel produced. . . . There's a new day a-dawning, because progressive industries are learning to cut costs through proper material handling methods."

CONSIDER for a moment what the handling phase alone can amount to in dollars per ton, using actual figures. In a specific instance, the handling of bulk materials from cars to storage, then from storage to process by hand, with labor at 80 cents per hour, was converted to conveyor handling. The new method was direct from cars to process, showing a saving of $1.13 per ton for the two handlings, or 56 cents per ton for each handling. Each operation—from car to storage and from storage to process—involved moving the material 50 feet. This meant a saving of 1.13 cents per handling, one ton per foot.—Dean Brown Becker, Total Project Engineering, Chicago.

"I HAVE been in the public warehousing industry all my life and it seems to me with the changes that are going on in distribution and the continuing high cost of labor, that those warehouses that do not apply the most modern materials handling methods would eventually be out of luck. I know as far as our firm is concerned, we are streamlining every single operation that is possible and mechanizing the handling of everything that it is possible to handle by mechanical means. . . . I believe that 90% of the merchandise that goes through our four warehouses can be handled by fork trucks and pallets. . . .

"A lot of detail had to be done prior to our actually making the installation. First we found that to have good materials handling of any kind we had to organize for it and put men in the key spots in the organization who understood something about pallet fork truck operations. The next step was to consider what that fork truck pallet operation would do in reference to our storage space. After all, we make our money out of our storage space and we found with proper layouts and the treatment of space that was developed in the Army that we could get better use of space than we had heretofore. Of course, we had to study the main types of commodities to be handled so that our pallets were of the right size and then the weight of a pallet load had to be considered when picking the fork truck equipment. Platforms, the doorways, elevators and the aisles, and all those

REG. U. S. PAT. OFF.

...WITH Acme Steelstrap

The most efficient shipping container is one that has all excess poundage trimmed off and is stronger. Acme Steelstrap builds up strength and makes containers better able to withstand the hazards of transportation.

Acme Steelstrap lowers shipping costs because: (1) original container costs less due to reduced weight of raw material and resultant manufacturers labor, (2) lighter containers mean less dead freight weight and, (3) claims for damage and pilferage are fewer.

Yes, shipping costs go down, profits up, when you use Acme Steelstrap. Investigate now.

ACME STEELSTRAP SCORES UP TO 11-1 SHIPPING SAVINGS

From an authoritative source comes . . . "we have used Acme Steelstrap extensively and found that it cuts overall shipping costs considerably. In labor, lumber; nails, screws and bolts; warehousing and shipping space and weight . . . savings, as high as 11-1, were realized over previous methods."

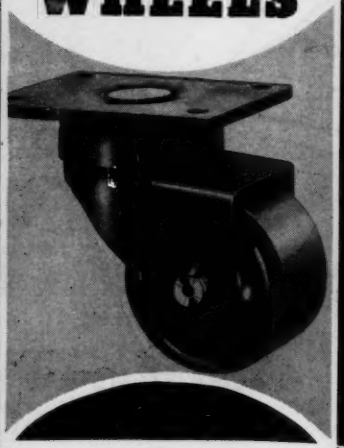
NEW YORK 17 ATLANTA CHICAGO 8 LOS ANGELES 11

ACME STEEL COMPANY

ACME STEEL CO. CHICAGO

DARNELL
CASTERS & WHEELS

Nearly 4000 TYPES of CASTERS & WHEELS



these low-cost floor protection products have been made to give you a long life of efficient, trouble-free service.

Free MANUAL

DARNELL CORP LTD
LONG BEACH 4 CALIFORNIA
60 WALKER ST NEW YORK 13 N Y
36 N CLINTON CHICAGO 6 ILL

kinds of things were taken into consideration in selecting both the pallets and fork trucks.

"I might sum it all up by stating that a complete study was made of our whole organization and of all of our facilities, fitting first the organization, then the space and then the details of each into two main pieces of equipment, namely, pallets and fork trucks. In conjunction with it, of course, we had to consider other types of equipment, such as conveyors and the 4-wheel and 2-wheel hand trucks and in some cases tractors. . . .

"The layout of space is most important not only from the standpoint of the use of mechanical equipment but also from the standpoint of getting as much usable space as possible. I think the Army did more to use space in the three dimensions, that is length, width and heighth, than ever had been done before. I understand that the warehousemen are used to speaking of space in square feet. I think this is wrong; it should be spoken of in terms of cubic feet. Of course, Army warehouses had high ceilings and we used mechanical handling equipment to good advantage to make use of the cube by the layout of the space itself from the standpoint of the location of the aisles and a plan of where large lots and small lots would be stored was more important. Very often the floor layout that has a minimum of aisles may turn out to be very expensive space from the standpoint of the total usability throughout a period of a year.

"To explain that, unless there are plans made to handle short lots, a warehouse will very quickly develop honeycombing which is impossible to overcome without rewarehousing the entire area. Some rewarehousing is necessary of course, but a good planned layout will prevent any major rewarehousing whatsoever. Of course, in laying out warehouse space the size of pallets and the type of materials handling equipment to be used has to be decided on first as the aisle width and locations depend on the size of machines to be used."—From an address delivered at the 54th annual meeting of the American Warehousemen's Association, by Col. Albert B. Drake, of Drake, Stevenson, Sheehan, Barclay, Inc., N. Y. C.

RISING labor costs are speeding up mechanization in food industries. Wholesalers and retail chains are mechanizing many stock-handling operations in their warehouses. Such devices as mechanical lifts and powered, hand-operated haulers will be used increasingly, especially in low-wage areas where the impact of new wage minimums provided in pending amendments to the wage act will be most severe. Canners, confronted with both higher wage costs and shortages of processing workers during the 1946 season, are installing much new equipment to eliminate hand labor in various stages of processing and packing.—*Newsweek.*

ONE million dollars worth of broken dishes are anticipated in shipping damage losses by the railroads this year. The Wirebound Box Manufacturers Association suggests that such damage losses can be substantially reduced with a certain type of cubical wirebound container. These containers have a shock-absorbing resiliency that is said to protect pottery.

TO PROMOTE safety and efficient use of mobile equipment, many companies are adopting training programs for industrial truck operators and other material handlers. While programs will differ in detail, just as production lines and storage practices differ, certain principles are applicable to plants in many industries. The material in these columns represents the main points of the training program developed by the Ohio Rubber Co., Willoughby, Ohio. It is here given in the hope that it may stimulate other plants to start a systematic training program for industrial truck operators.

After the prospective driver is cleared through the Personnel & Dispensary examinations for physical fitness, etc., he is turned over to the Trucking Department foreman. He is taken on an extensive trip through the plant, and the general plant layout, departments, buildings, main trucking aisles, etc., are all explained to him. He then returns to the Trucking Office and is given a booklet of Trucking Rules. After making a careful study of the Rules he is turned over to a qualified instructor and his training proceeds as follows:

First half of first day: Shown gas powered truck operation, best way to handle loads, general movement of material handled by gas truck.

Balance of first day: Actual operation of truck in simple jobs, under close supervision of instructor, who corrects any wrong methods, mistakes etc.

Second day: Same as first except that all instructions and actual operations are on electric trucks.

Third day: The new driver spends some time on gas trucks and some time on electric trucks doing regular trucking jobs "on his own." This work is closely checked by the Trucking Department foreman. The driver must then give a practical demonstration of his driving ability by performing any given jobs under observation of the Trucking Foreman and Material Handling Supervisor. If this test is passed he is assigned to a regular shift and if approved by the shift foreman, is given an Authorized Driver's badge and is in line for any regular trucking job. If he is not approved on his first demonstration of driving ability the first two days of instruction, and then fails again in a later test, he is returned to the Personnel Department as unsatisfactory for truck operation.

Following are the rules and regulations, as printed in the company's booklet, which every truck operator must study and observe:

Your Job Is Important

As a truck driver, you are an important link in our production team. The greater your ability to move your loads safely and speedily from place to place, the more steadily others will be able to work. Materials aren't worth much when they are left standing still. They have to be picked up and moved again and again before they leave the plant as a finished product. It is your job to see that every move is made as safely, speedily and efficiently as possible.

Before You Start

Relax—but be alert. Have your mind on your job. If something is bothering you, get it off your chest. Talk it over with your own supervisors or with the Personnel Dept. Maybe they can help you. Like other worthwhile jobs, driving a truck is work calling for plenty of common sense, good sound judgment, and the ability to do the right, safe thing in split seconds.

Don't Use Your Truck Until You Do These Things. 1. Check the battery on electric trucks. If it needs changing, the electricians still do the changing. 2. Check gas, oil and water on gasoline trucks. Don't be caught short. 3. Check all controls for proper operation. Report any faulty control to your foreman immediately. 4. Report anything else that does not look right to you, such as twisted forks, dents, etc. This will insure correction of the trouble and will prevent you from being blamed for something you did not do. 5. Make sure your hands are clean and dry. Never drive with wet or greasy hands.

Let's Go

1. Get under your load squarely with both forks or the platform. If you use only one fork or the corner of the platform you may permanently damage the whole truck. 2. Increase speed gradually. Sudden starts put a heavy strain on your truck. 3. Always operate your truck so that you will have a clear view of the road ahead of you.

Running Rules

1. Be sure your truck clears obstructions from above, below and at sides at all times. 2. Drive carefully—move right along but keep your truck under control. Other people are working, too. 3. Sound your horn and slow down when approaching curves, corners, blind spots or congested areas. Make turns cautiously—somebody else may be just around the corner coming toward you. 4. Take it easy when traveling near pits, approaching elevator doors, across bridges, down inclines, over ramps or across railroad tracks. 5. When crossing tracks, or traveling over wet, slippery or rough surfaces, SLOW DOWN and keep a firm grip on the steering wheel or lever. 6. Don't play dive bomber. Proceed cautiously. Keep a safe distance from other trucks and pedestrians. 7. When approaching or passing noisy machinery—Be Extra Careful. Use your horn only when needed. Be sure your signals are heard. 8. Don't cut corners. You may have to stop quickly and

either spill your load or injure someone. 9. Try to avoid driving an empty truck. Every minute of your truck's time is needed for productive work.

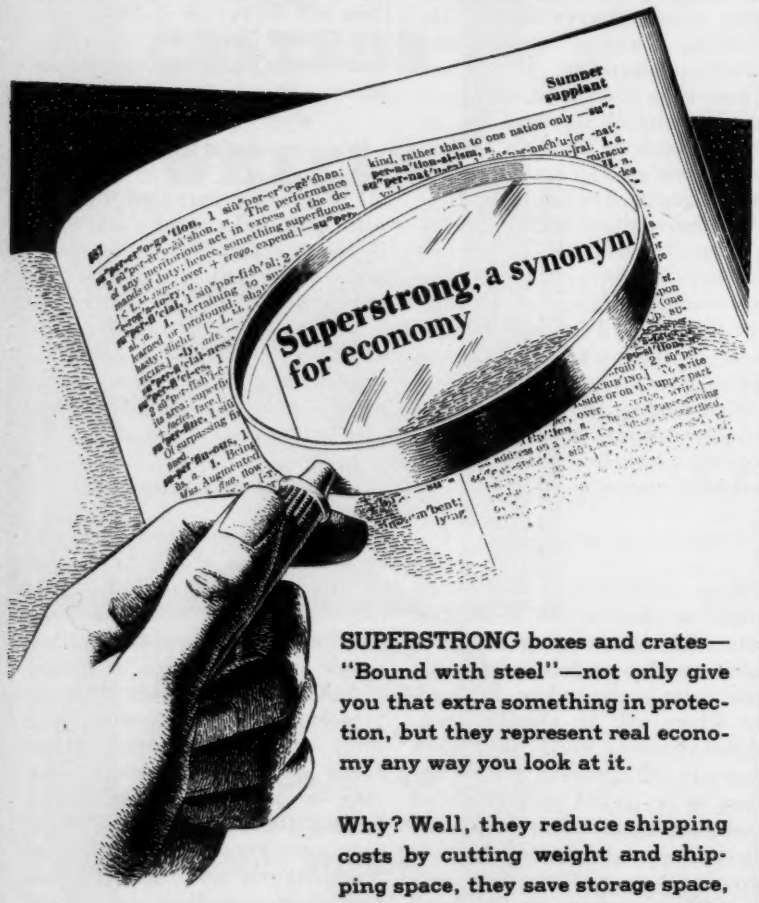
Overhead Doors

1. If the door is open as you approach it—Watch Out. Someone else may have just gone through and pulled the string to close the door. Don't let it catch you. 2. Come to a complete stop and sound your horn, stop and look behind you. Make sure that no one else is coming through before you close the door.

Elevators

1. When approaching an elevator, stop at a safe distance, walk to the door and press the call button. 2. Be sure that the elevator doors are fully opened before you drive on or off the elevator. 3. Drive onto the elevator platform first. 4. Make certain your truck will fit in the elevator. 5. Watch the weight of your unit. There is a capacity for each elevator. Don't overload. 6. Dismount from your truck while on the elevator and do not remount until the doors are fully open.

It's Not A Tank. 1. Don't ram your truck into projections, such as building columns, boxes or piles of material, or loaded skids. 2. Don't operate off the concrete. 3. Don't operate over obstructions in the floor, pieces of metal, broken glass or other obstacles.



SUPERSTRONG boxes and crates—"Bound with steel"—not only give you that extra something in protection, but they represent real economy any way you look at it.

Why? Well, they reduce shipping costs by cutting weight and shipping space, they save storage space, they save many hours in assembly time, they eliminate damage claims—just to mention a few points.

Smart buyers always choose . . . SUPERSTRONG.

SHIPPING SUPERSTRONG CONTAINERS

RATHBORNE, HAIR AND RIDGWAY COMPANY
1440 WEST 21st PLACE • CHICAGO 8, ILLINOIS

Aisle Conduct

1. When two trucks approach each other in an aisle, the loaded truck has the right of way. 2. If both trucks are loaded, the larger capacity truck has the right of way. 3. Any crowding of aisles by placing of material in them, or any unsafe conditions should be reported at once to your foreman. 4. Never leave your truck parked in an aisle, even for a minute. If you are going to get off, get it in the clear first.

Stopping

1. Use brakes when needed—try not to have to jam them on. It's bad for the truck. Such practice may spill your load; worst of all, it may spill or injure you. 2. When dropping a load, position it so that it will be most convenient for the person handling it. This person may be you.

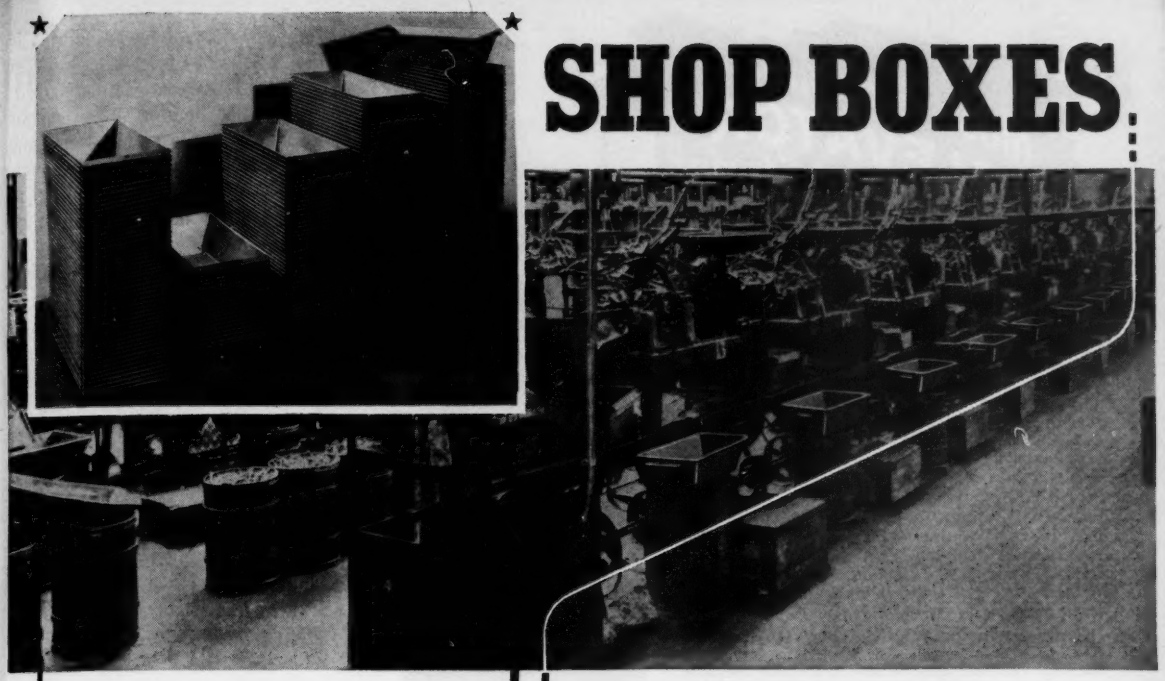
It's Your Truck

1. Never allow a passenger on a truck under your control. 2. Don't allow anyone to operate your truck. 3. In case you do have an accident, or trouble of any kind, an accident report must be filled out at once and turned in to your foreman. It is very important that this be filled out immediately, and as completely as possible.

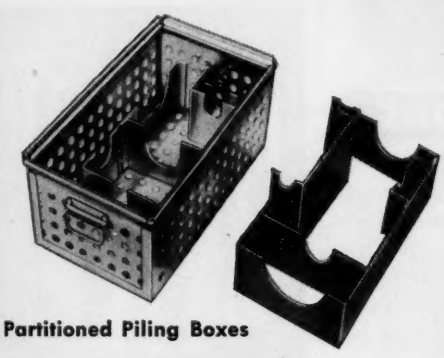
Always Remember: Take your time. Keep your head. Cooperate with your truck and make it cooperate with you. You are its master.

Bringing Home Infractions

Whenever an accident occurs in which an industrial truck is in-



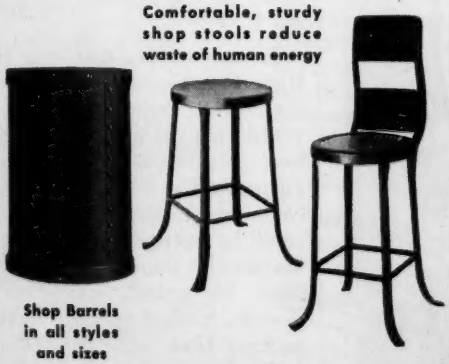
SHOP BOXES



Partitioned Piling Boxes

Plain Piling Boxes
many sizes

Comfortable, sturdy shop stools reduce waste of human energy



Shop Barrels in all styles and sizes

the INFANTRY of Materials Handling

● Wherever small castings, stampings, forgings, bolts, nuts and a thousand other small products or parts are made or assembled, the right kind of metal shop containers are as indispensable to more efficient materials handling, as is G.I. Joe to the success of the Armed Forces. And because its importance is so often overlooked, the humble, inexpensive shop box, tailor-made to fit individual needs, offers most attractive opportunities for lowering production cost.

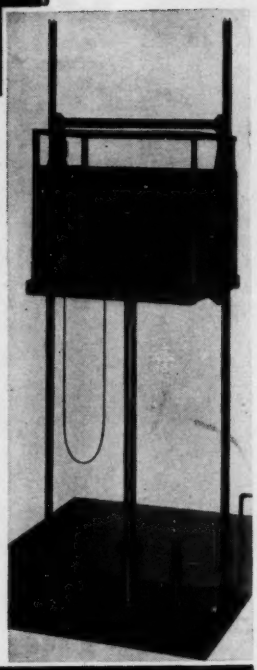
Partition Piling Boxes are important new time savers on assembly lines. Partitions are designed to hold one set of components for any given assembly or sub-assembly. Automatically insures against errors and delays in reaching for the right parts.

Catalog contains many money-saving new and old ideas in steel shop equipment. Send for it.

STEEL FACTORY EQUIPMENT DIVISION
Cleveland Wire Spring Co.
2012 WEST 25th STREET • CLEVELAND 13, OHIO

Cleveland
STEEL SHOP EQUIPMENT
STOCK STYLES FOR GENERAL UTILITY
BUILT-TO-ORDER to meet special requirements

Most Economical ELEVATOR for 2, 3 or 4 Stories



Oildraulic Elevators are designed for dependable operation at lowest cost. No penthouse or heavy load-bearing shaftway structure required . . . powerful hydraulic jack pushes load up from below. No special machine room needed for compact power unit.

You can count on this modern elevator for hydraulically smooth operation and very accurate landing stops. Power used during rise only—economical. Car sizes and capacities as required. All popular controls. Practical for rise up to 40 feet. For freight or passenger service. Backed by Rotary Lift Company's experience in building over 40,000 hydraulic elevating units in the past twenty years.

Catalog RE-301 Will Help You Plan

Our illustrated catalog on Oildraulic Elevators contains valuable information on modern elevator service for new or existing structures. Preliminary layout data is a big help in drawing up plans. Write for copy of Catalog RE-301 today.

ROTARY LIFT CO.
1169 Kansas, Memphis 2, Tenn.

Rotary OILDRAULIC ELEVATORS

A ONE MAN JOB...

CLARK MATERIAL HANDLING EQUIPMENT

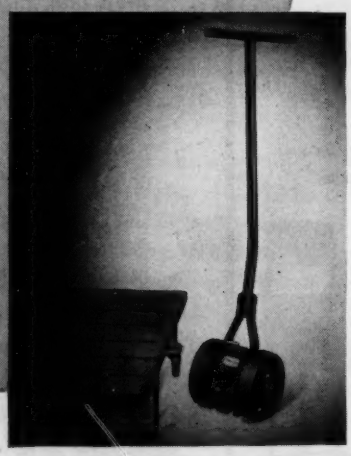
One man . . . using CLARK lift jacks and semi-live skids . . . reduces operating costs . . . and saves labor of 3 to 4 men.

Low cost of CLARK lift jacks and semi-live skids permits use of many in every plant . . . quickly pay for themselves by reducing operating costs.

Maneuverable with a full load to within 12" of another platform before being disengaged . . . CLARK lift jack is light enough . . . only 42 pounds . . . to be carried out overhead . . . if space does not permit rolling out.

By spotting CLARK lift jacks near machines . . . operators may keep own machines supplied with stock . . . saving time of calling for larger equipment.

Information and prices on CLARK lift jacks and semi-live skids to handle YOUR problem may be had by writing to our Dep't. "F".



★ BUILT BY

CLARK

ALL STEEL WELDED TRUCK CO.

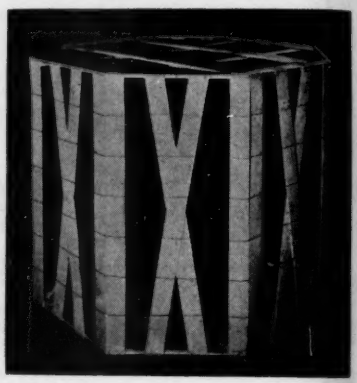
MAIN OFFICE: ROCKFORD, ILL. FACTORY No. 2: DYERSVILLE, IA.

volved, a notice of the accident is posted on the bulletin board in which the details are summarized A paragraph headed "To Avoid Repetition" contains instructions on what to do to avoid similar accidents. Another paragraph with the heading "Rule and Section Violated" points out that portion of the Rules and Regulations which were not observed.

This posting of accident notices has had a marked effect on personnel performing material handling duties. Members criticize those of their number who become careless, and every effort is made to maintain a good record by safely handling material.

HANDLE WITH CARE

VENTILATORS aren't eggs, but they do bruise easily because



they are manufactured of light gauge steel, and therefore require careful handling. Units of the type shown here, standing five feet high and six feet across and weighing as much as 375 pounds each, were shipped during the war to all parts of the world as well as to many types of construction projects in the U. S.

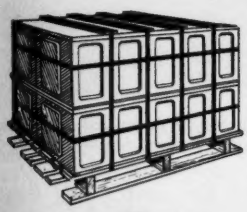
In cooperation with the H. H. Robertson Co., Pittsburgh, one of the world's largest distributors of ventilators, the type of crate shown here was developed for shipping purposes. The wirebound container came in pre-assembled flats that could be wrapped around the ventilators in minimum time. And since its weight was only 147 pounds, both shipping weight and packing time were reduced. This type of container will be used for peacetime shipments.

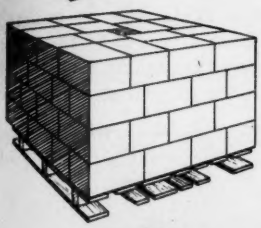
THIS OR THIS

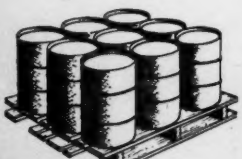
Generalift Pallets

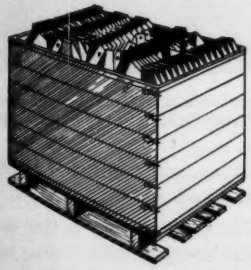
★ ★ ★ ★ ★

SAVE 50% TO 90%









Throughout the war years, the armed services report numerous examples of 50% to 90% savings in materials handling through the use of pallets and fork lift trucks. Instead of picking it up and laying it down, moving it piece by piece—the "old bucket brigade"—many items can be consolidated into single loads, palletized, moved as *one.*

Result: one workman and fork lift truck do the work of many . . . reduce handling costs, save time and packaging materials . . . protect shipments from costly damage in transit . . . simplify warehousing and the taking of inventory (count pallets instead of single items).

That's why so many thousands interested in the speedier and more efficient handling of materials, components, and finished products are turning to pallets. That's why you too should check on this important subject *today.*

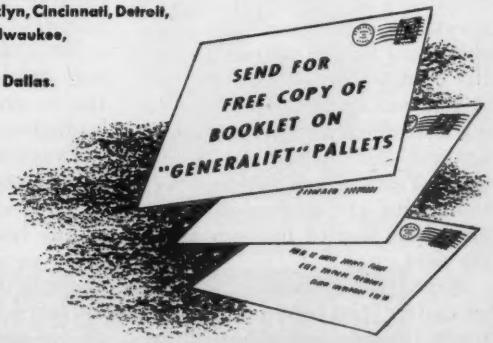
●

Generalift Pallets, Skids, and Lift Boxes are made of sturdy hardwood construction. Designed for long life, rough handling, extra heavy loads! Generalifts are made to meet your *specific requirements.*

ALL TYPES OF ENGINEERED SHIPPING CONTAINERS

GENERAL BOX COMPANY

GENERAL OFFICES: **60 West Illinois St., Chicago 10, Illinois**
DISTRICT OFFICES AND PLANTS: **Brooklyn, Cincinnati, Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, New Orleans, Sheboygan, Winchendon. Continental Box Company, Inc.: Houston, Dallas.**



ECONOMIZE . . . PALLETIZE . . . GENERALIZE!

PUSH AND PULL . . .

(Continued from page 31)

ing snagged while the pans are being dragged by means of a chain and hook attached to the tractor.

Machining areas for parts and assemblies (weighing up to a ton) are served by hoists on travelling beams supported by trolleys on

Tractors push and nose the heavy pieces into closely spaced assembly stations.

arch beam trackage. The hoists speedily transfer material from machine to machine. This method prevents floor areas around machines from being obstructed and gives operators maximum working area. The hoists, which are motor-operated, have pendant controls and inch the pieces into position on the machines, thus avoiding damage to parts or machines during handling operations.

Castings Are Assembled

The assembly area consists of two bays and contains two five-ton overhead cranes. After the pan has been positioned by the tractor, assembly of the machine begins. The cranes remove the headstocks, gear boxes and top plates from load carriers and spot them accurately. Positioning tasks, such as holding long main shafts in a chain sling at the proper level for insertion into the gear box, are also performed by the cranes. Because the cranes make use of the area around and above the machines being assembled, aisle space between assembly stations is held at a minimum. Trucking and pushing operations here are performed in one main aisle located between assembly lines.

Hand trucks, table-type trucks on casters, and powered industrial trucks move smaller pieces into position along the assembly lines. This handling equipment is specially designed to bring the parts to the machine at a convenient height for removal and assembly.

Moving Assembled Machines

After a machine is completely assembled, it is hauled into the main aisle by a tractor. From here, it is either pulled or pushed to a spray booth. At this point, the heavy machine is raised by hand lift jacks high enough above the floor so that a wooden skid may be placed underneath. The skidded product is then moved into proper spraying position by either one or two tractors, depending on the size of the unit. After painting, it is again moved by tractor to the shipping area. When two tractors are used on the heavier machines, one pulls while the other pushes. In the shipping area, a crate is placed over the finished product and secured to the wooden skid. The load is then ready to be pushed across the loading dock into a

Gear box is brought to main assembly line on load carrier and placed in pan by crane.

freight car. In order to turn the crated machine into position inside the car, a 6″x8″ board is nailed to the floor at the proper angle, and as the tractor pushes on the sides and corners of the crate, the front end is swung into position by the timber. If necessary, the tractor enters the freight car to complete the loading operation.

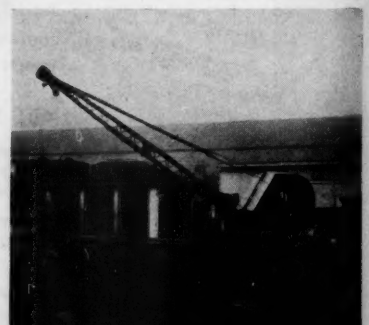
Thus the "push and pull" method was adopted in view of the weight of the pieces and the low headroom of the building. To jack up the heavy pans in order to insert dollies underneath would require another lifting operation when the dollies are removed. Also, during some of the machining operations, the pans must be held in a rigid position on the floor. The present system, therefore, was designed to avoid lifting tasks and possible hazards. This likewise applies to the movement of the completed machines, which require only one lifting operation (when the unit is placed on skids).

Removing the Scrap

Scrap from the many machines is collected in steel drums. Machining operations are extremely varied and the resultant scrap not sufficient to justify a special installation for collection and disposal, according to the company. The filled drums are heavy, and lifting is avoided by rolling them on a flat steel skid, equipped with four two-inch steel bars serving as runners underneath. The skid is hauled by trac-

Scrap is collected in drums and hauled on skid plate to the scrap fits by tractor.

tor around the shop. The front end of the skid plate is curved, and the chain attached to the tractor is looped through an opening at the top of the curved section. The



Mobile crane with clam-shell bucket loads the scrap into gondola-type freight cars.

loaded drums are emptied into one of several scrap pits.

A mobile crane removes the material from the pits with a magnet or clam-shell bucket and loads it into gondola cars.

A BIG JOB

(Continued from page 18)

shop, there are two 30-ton cranes and one 15-ton crane. These cranes, and others in the side bay, are cab-controlled, and all hitches are made by workers who make a specialty of the job. No one else in the shop is permitted to make a hitch. The cranes perform lifting and handling tasks requiring chains, wire rope slings and like equipment. When a hitch has been made, the crane operator can refuse to make a lift if he objects to the hitch. Should the crane operator and the worker making the hitch not agree, the foreman is called upon to aid in making a decision.

All chains are inspected once a month, and are annealed at least once a year. Chain slings are used singly or in pairs for two, three, or four point suspension. Chains have hooks at either end forming two legs, which are lengthened or shortened depending on the shape or weight-distribution of load to be lifted. Normally, those chain slings most likely to handle material in a given area remain in that area or are brought back to a convenient station. This practice saves time that might be spent in search.

On highly polished and machined pieces of smaller weights, manila rope slings are used. Wire rope slings are also part of the equipment for moving material.

Many heavy jigs and fixtures are used on milling and other machines. As per layout, a centrally located store room off to one side is reserved for their storage. A chain hoist on a traveling beam services this area and removes jigs and fixtures from racks as needed. Transfer cars bring them beneath the span of cranes, which are used in mounting them on machines.

Along the side bay of the Main Machine Room are several machining stations for less heavy and smaller parts. This area is served by two 10-ton cranes.

Assembling the Heavyweights

After the castings have been machined they are removed by crane to the flat-top cars. A yard engine removes the car from the building and it is then switched to the first erecting room, where the assembly begins.

In the smaller erecting room the bay is divided and two 20-ton overhead cranes service the area. Castings which are brought in on "flat tops" are removed by these cranes to the assembly stations. The main frame (or base) is set on one of two assembly lines in which steel tracks are embedded in the floor. These assembly lines improve assembly time and reduce travel distance and lifting tasks. After a few sub-assemblies have been made, specially constructed rollers move the engines along the tracks with the help of the cranes to the next station.

As the engines approach the larger erecting room, two 30-ton cranes complete subsequent transfers. These cranes, which travel at a height of 55 feet, have extended cabs to give operators better visibility of the floor. The completed assembly weighs 56 tons and is handled by two 30-ton cranes. These lift an equalizing beam in whose center is a bearing surface on which the swivel type hook turns. The two cranes lift and move the engine by using slings, and the beam with swivel hook permits the lift to be swung to any desired position.

After completion of assembly and testing, the two cranes using the equalizing beam set the engine on a wooden skid mounted on a flat top car. The engine is then crated and the flat car is hauled to a siding along a concrete platform. Here a locomotive crane unloads the crated engine. Crates containing engines and compressors are permitted to accumulate on this concrete storage area until there are a sufficient number of units to complete a satisfactory shipment.

This concrete platform, which is 350 feet long and 30 feet wide, can accommodate a number of heavy units. The locomotive cranes tier some of the crates.

The material handling system at the Cooper-Bessemer Corporation is characterized by well engineered applications of mechanical handling devices to do an exceptionally heavy and speedy job. Handling aids having a limited operational range are successfully coordinated with others having a more flexible movement. The result is a balanced flow of material and parts through the entire production procedure.

Not merely built, but

Engineered for Utmost Safety

● The very dangers which most often threaten life, limb and load simply don't happen when you use ACLC Safety Hoist Hooks.

Makeshift mousing gives place to automatic mousing. Snagging can't occur because no protruding point "asks" for it. Hook straightening and load slippage are avoided because the patented shoulders and lip LOCK the load in perfect alignment.

Time saved—men spared—cleaner jobs; hence more profit. Send for details Now!

American CHAIN LADDER CO., INC.
151 East 50th St., New York 22, N. Y.

ACLC Safety Hoist Hooks are manufactured in three models—Eye Type, Shank Type, Shackle or Clevis Type.

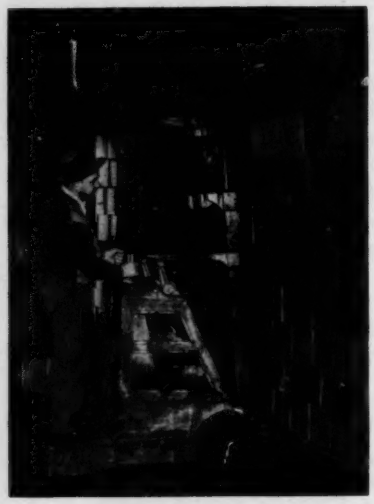
ACLC *Safety* HOIST HOOK

INSIDE A GROCERY WAREHOUSE

PLANNED storage areas, multi-unit loads, and various material handling devices enable the Cleveland warehouse of the Kroger Grocery and Baking Co. to handle 1,500,000 pounds of merchandise a month.

Incoming freight is spotted on a spur along the east side of the building, and a loading dock for highway trucks and trailers is located on the west side.

One of the phases of the handling operations concerns the allocation



of storage space on the basis of weight and probable time the units will be in storage. In other words, heavy items are transported the least possible distance and merchandise that will turn over quickly is made more accessible.

The warehouse building has four stories and a basement. With the third floor occupied by the com-

pany bakery, three floors and a basement, or more than a half million square feet, are used for storage purposes. Heavy stock, such as canned foods, flour and sugar, are generally stored on the first floor. Produce and other perishable goods which remain in storage the shortest possible time, are also stored in this area. Semi-heavy merchandise, such as soap and salt, is kept in the basement. Light-weight articles and broken lots of packaged items, coffee and cigarettes, for example, are housed on the second floor, while surplus stock is kept on the fourth floor.

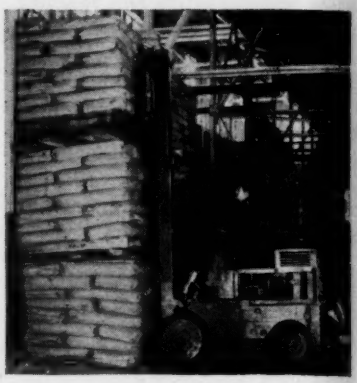
Powered and Manual Equipment Coordinated

Four elevators, two in the center of the building and two at one end, handle the merchandise between floors. The elevators have platforms large enough to accommodate several loaded skids or pallets at a time.

Four-wheel hand trucks move over 70% of the freight in unloading operations. Palletized loads are carried on this equipment directly from freight cars to the storage area, where the units are tiered by fork lift truck. Hand lift trucks are also used in unloading and storing. They handle palletized loads on skids. Produce is generally not palletized, but moved directly on the skid by these trucks.

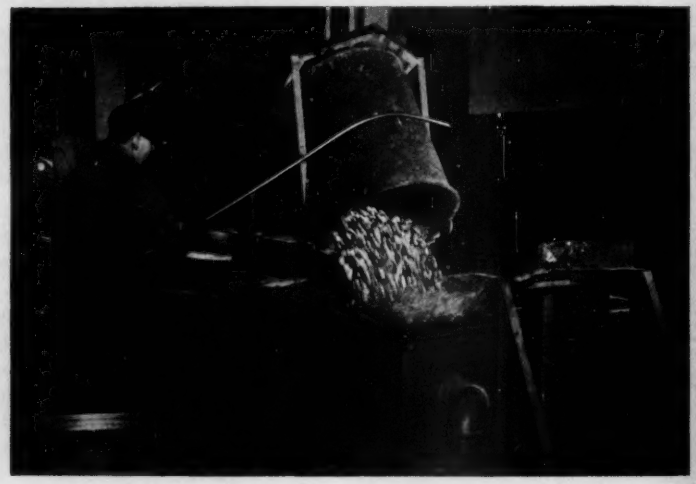
Efficient use is made of storage space by tiering merchandise up to the ceiling. Countable palletized loads, accurately spotted and stacked, make inventory control a simple matter.

When merchandise is taken from



storage, the orders are picked and moved on platform trucks. After a unit has been assembled, it is taken to the loading dock and spotted on the highway trucks.

THOUSANDS of small parts, used for fittings, cylinder bodies, etc., are handled with ease from the furnace to the water quench by means of this special barrel dumping device. The rigid stand



consists of two pieces of pipe connected by a round crosspiece. Over the latter a larger pipe is fitted to serve as a hinge for the movable frame. The frame consists of lengths of welded angle iron connected by a sheave to the stand. A lifting arm with a hook is hinged to the bottom of the frame. For dumping, the hook of the monorail hoist is threaded over the hook on the dumping device, and a V-shaped angle iron holds the barrel when in an up-ended position.—Courtesy, The Weatherhead Co., Cleveland.

---

5 TONS IN 2 MINUTES . . .

(Continued from page 28)

are at an angle that permits coal or coke to be carried without rolling back. The discharge end is high enough to clear the foot end of a portable flight conveyor—regardless of whether the conveyer is placed in line or at an angle on either side of the car unloader. After the highway truck and flight conveyor have been swung into position, the conveyor and car unloader are started and the operation is completely automatic. Officials at the Goff-Kirby Co. state that these mechanical handling devices unload a rail car and load a highway truck at the rate of five tons every two minutes.

At Cleveland's Penrose Coal Co. similar equipment is employed without the use of pits. At this company, the foot end of the car unloader is placed above the rails and receives the coal as the rail car doors are opened. Flight conveyors receive the coal from the car unloader and carry it to a waiting truck.

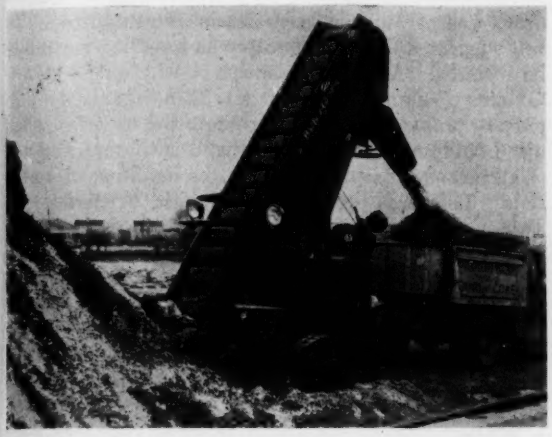
The flight conveyors used at both companies have screening units which are gravity fed and are near the discharge end of the conveyor. Through these screens drop slack or coal dust into a spout which piles it to one side. The end spout or point of discharge for the coal itself can be raised or lowered in order to regulate the flow of material from conveyor to truck. One of the features of this type of conveyor is that the boom can be raised or lowered without taking the transmission out of gear. Thus throughout the handling operation the equipment can be adjusted to discharge material at the desired height and over the carrying facilities of the waiting highway truck. Since the conveyor unit is self-propelled, it can be easily moved into position before operations start.

At the yard of the Cleveland Builders Supply, a mechanized portable bucket loader is used for reclaiming bulk materials from stockpiles. This device is self-propelled and has a crawler type tread which permits it to move easily and quickly over the uneven terrain adjacent to stockpiles.

Even, Automatic Loading

One end of the bucket loader is backed into the side of the pile. Beneath the discharge end a highway truck is positioned so that the first material will fall on the part of the truck bed nearest the front or cab. As the bucket loader works its way into the pile it moves its spout or discharge end towards the rear of the truck. The result is an automatic even distribution of the load over the carrying facilities of the truck.

Company officials state that, whether handling gravel or coal, the device will load a five-ton truck in one and one half minutes. One of the features of this portable bucket loader is equipment consisting of special feeders for digging into the pile. This device breaks up lumped or caked formations and eliminates a former manual operation which required a pick.



A self-propelled bucket loader carries the bulk material from stock pile to highway truck.

Wheels at the bottom of the bucket loader dig into the pile and feed material to the buckets.

HOW TO CUT PRODUCTION COSTS

• Every time your employees handle a package, carton, box or case . . . it costs you money . . . it adds to your manufacturing cost!

• Speedways Conveyors save time . . . save labor . . . cut down production and distribution costs . . . by using *gravity!*

KEEP 'EM ROLLING WITH SPEEDWAYS

• Lightweight • No Tools Required
• All Purpose • Low Cost

IMMEDIATE DELIVERY

Speedways is stocked by agents in principal cities of U. S. and Canada.

•

Write for descriptive literature and prices

•

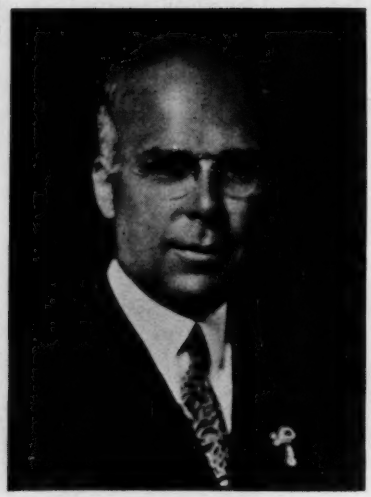
STANDARD MODELS

12", 15" or 18" wide—5' or 10' lengths, 6, 8 or 10 wheels per ft. 45° or 90° reversible curves—3 sizes adjustable stands—from 12" to 78".

SPEEDWAYS CONVEYORS, INC.

1242 NIAGARA ST. BUFFALO 13, N. Y.

A CHALLENGE TO MANAGEMENT



By ROBERT M. GATES

President Air Preheater Corp., Past Pres. American Society of Mechanical Engineers & First Chairman Materials Handling Division A.S.M.E.

MANY industries, faced with increased production costs that they cannot avoid, can offset such increases by means that their managements have never adequately used or even consistently explored.

Of this I am convinced from an experience of many years in industry, in which I acquired at the start an interest in the *handling of materials*. This interest has been retained. I have had opportunities to watch how materials were handled in many plants and to learn how productivity has been increased in plants whose managements have given this phase of operation special and persistent attention. We all know that improvement in this respect has been a large factor in industrial progress; but complacency has often set in after a certain degree of progress has been achieved. In many industries materials are still handled very uneconomically. In most industries the possibilities of improvement in handling are not given continuous and cooperative consideration, from top management down to unskilled workers.

Mechanical Engineers Undertake Promotion

Organized promotion of this industrial development arose naturally among the suppliers of mechanical equipment for handling materials. Twenty-five years ago a group of manufacturers of handling machinery, who had formed an association, considered setting up a technical department to deal with problems of standardizing equipment and means of increasing effectiveness of materials handling. Zenas W. Carter was executive secretary of this association. At the same time the American Society of Mechanical Engineers was organizing its professional committees. It was suggested that a committee on handling materials be included. A canvass showed a widespread desire for such a committee, which was then organized. The purpose was not merely to promote the use of mechanized equipment, but to study and encourage the use of all means of improvement in the handling of materials. This was quite in line with Frederick W. Taylor's ideas of scientific shop management presented to the A.S.M.E. some years before.

Since that time the A.S.M.E. Materials Handling Division has pushed the movement vigorously and contributed substantially to its spread.

What Experience Has Taught Us

Within a single generation more has been learned about efficiency in production, I believe, than in all the previous history of industry. The meat-packing industry has done pioneer work in simplifying the handling of the materials with which it deals. Then came the automobile industry whose development of assembly-line production brought the automobile within reach of a great majority of American families. Its spectacular success stimulated the use of mass-production methods, with revolutionary improvements in materials handling, in many other industries. The marvelous volume and acceleration of production during the war could not have been achieved without the resourcefulness and efficiency our engineers had developed in the prewar years—not least notably in handling of materials.

Our war experience has emphasized, also, the vital importance of efficiency in handling products in distribution. The amazing feats of logistics we read of were made possible by the ingenuity of engineers in devising ways of avoiding or breaking bottlenecks in handling supplies, of expediting loading and unloading, of moving a ton with no more expenditure of time and less of muscular energy than a hundredweight had required before. The savings obtainable by palletizing unit loads and by instruction in scientific handling methods were brought to the attention of countless persons who had previously thought little about them.

From the revolution in the handling of materials that such experiences have accelerated we have been learning anew to measure the value of labor—not so much by time spent on the job as by contribution to production or distribution. We are enabled better to realize that we can increase that value, to the advantage of both worker and employer, by the elimination of wasteful methods in handling materials. Modern industry should have no place for unnecessarily fatiguing and retarding muscular effort, or for uncoordinated activities that create bottlenecks. If

all employers devoted to the human factor in production—and to physical distribution—as much attention as they have to give to disputes over the sharing of earnings without improvement in productivity, they would have less such disputes on their hands.

In industry we seem to have shown greatest concern, quite understandably, for saving the time and effort of the consumer. The automotive industry gives infinite attention to the provision and placing of gadgets that serve the comfort and convenience and reduce the physical and mental effort of the driver. He is no longer required to fumble in the tool chest for a crank and then use it laboriously and perilously to start the engine; nor does he have to reach more than a few inches with hand or foot for any control. For the driver is the customer. In the typewriter we have seen a continuous procession of devices that reduce the motions required for operation and save time and effort. For the satisfaction of the operator plays a large part in the purchase of one make of typewriter rather than another. And every typist is instructed in the art of operating the machine with a minimum of wasted motion.

Now the factory is a multiple machine. Its parts, even the individual machines, do not run regardless of operators, materials, and one another, as rockets might be released for flight. The day's output of the factory depends on the continuous cooperation of many interdependent parts. If some of them, mechanical or human, are slowed down by unnecessary stoppages, the productivity of the rest is reduced. And that is true if the handling of materials, or any part of the manufacturing process involving manual effort, does not match the efficiency of the rest or permit the best use of other workers' time.

Waste of Human and Mechanical Energy

It has been my privilege during the past few years to take part in many war production clinics. From these discussions it has appeared that the increased production of many companies was achieved largely by changes they had made in methods of handling either raw materials, work in process, or final product. Production engineers have brought to our attention many such changes and the results of them.

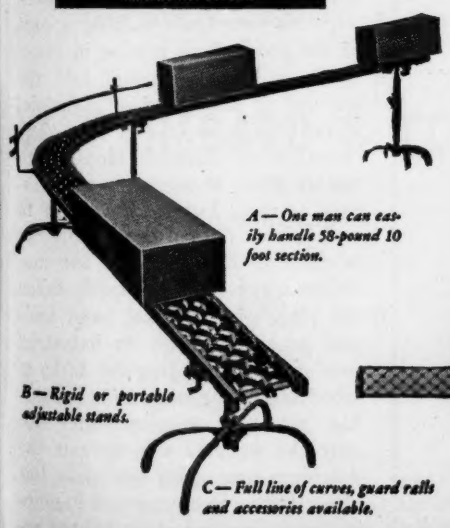
Some who were interested in biomechanics, reporting the effect of eyestrain, nerve strain, and other physical fatigues upon production, have found the solution in most cases to be more intelligent handling of materials.

Spoilage and rejection of product may often be caused by careless picking up or putting down, or by injury in containers used in the manufacturing process. Certainly the fault is more often with the human handling than with the work of the machines. The opportunities for manual mistakes can be reduced.

Few machines in manufacturing plants are used to their full capacity, even where this is highly desirable. The unemployment of machines may be equivalent to a daily shortening of hours worked or represent a drag on the productivity of the whole plant. Often improvement in feeding the work to the machines or in taking

MARKET FORGE COMPANY
STANDARDIZED MATERIALS HANDLING EQUIPMENT

LOAD-VEYORS
SEND FOR LOAD-VEYOR MANUAL No. 1004MH



A—One man can easily handle 58-pound 10 foot section.

B—Rigid or portable adjustable stands.

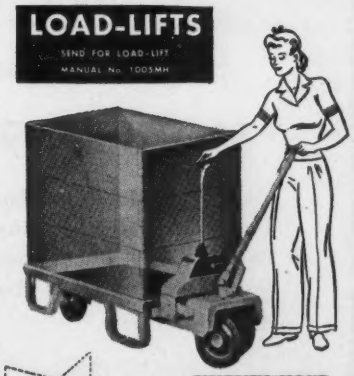
C—Full line of curves, guard rails and accessories available.

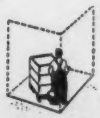
A MAGIC CARPET FOR INDUSTRY

Load-Veyors combine great strength and light weight. Exclusive Market Forge features . . . grid construction supports ball bearing rollers on both sides . . . hardened inner and outer ball bearing races minimize wear . . . Load-Veyors may be used on either side . . . rails on reverse side provide for safe conveyance of small packages.

Write for name of nearest industrial distributor who stocks this equipment.

LOAD-LIFTS
SEND FOR LOAD-LIFT MANUAL No. 1005MH





SIMPLIFY YOUR HANDLING PROBLEMS

The use of the Load-Lift system will greatly increase your plant efficiency for the smallest capital investment of any adequate materials handling system. Saves double handling — utilizes space advantageously — reduces fatigue — eliminates damage from elements.

MARKET FORGE COMPANY MATERIALS HANDLING DIVISION 60 GARVEY ST., EVERETT 49, MASS.

it away from them has put idle equipment to work.

I have seen nearly automatic machines slowed by such trifling conditions as wrong placing of workers or materials for some simple operation, requiring a reach that took too much time or effort; or stopped at intervals because of inappropriate methods of bringing up or taking away materials; or failing to earn their way because the loading or shipment of the product was not coordinated with production.

We have noted great improvement in the handling of goods by common carriers—railroads and ships. It has been a major factor in reducing the time of freight transportation. Yet the carriers hardly keep pace in the improvement of methods with the increasing volume of goods they have to handle, and there is still much room for progress in loading and unloading methods, as well as in putting up goods for shipment. The pallet, as used in handling materials, was not common enough before the war to attract the notice of even the vigilant editors of *Webster's International Dictionary;* indeed it is not mentioned even in the 1943 edition. The traffic situation in our cities also challenges the engineers of handling goods as well as the engineers of traffic.

A Job for Management

In the quest for improvement in the handling of materials we must depend, as always, on the use of more and better mechanical equipment. The utilization of water, steam, and electric power instead of muscular power, with the substitution of mechanical devices for human hands and hand tools, has been the outstanding feature of our industrial progress. But we have not removed the need of manual skills and human effort in mechanized production, which at most is only partly mechanized. Between the hog's embarkation for Chicago from an Iowa farm and the emergence of a ham from a refrigerator car in New York, the work of many persons as well as the service of many machines has been required. The assembly lines in the most modern automotive industry's plants give employment to considerable numbers of workers. Indeed the coordination of human skills and efforts in a modern factory is more necessary but more complex than ever.

What is now required is not merely the coordination of the labor of a number of workers, each with his own tools making a part of the product, or joining in gangs to do a largely manual job; the amount of that kind of industrial work diminishes year by year. The coordination of human factors with one another, of course, is as necessary as ever, but we have now to coordinate them also with the mechanical factors—with the machines which have so largely taken the place of individual hand tools and human muscles in industrial production, lightening the tasks of labor and at the same time increasing industrial employment. Not only the workers who operate the machines processing materials, but also other workers engaged in moving materials and other related activities, need to be so equipped and trained and given incentives that

PLAN TO ATTEND

THE 1946 **INDUSTRIAL PACKAGING EXPOSITION**

HOTEL SHERMAN

CHICAGO, ILLINOIS

APRIL 24-25-26

Display of Materials, Equipment and Supplies used for Industrial Packaging. 3-Day Educational Clinic covers Corrosion Prevention, Interior and Exterior Packaging, Materials Handling, Palletizing, Loading and Shipping.

Write for Official Program

INDUSTRIAL PACKAGING ENGINEERS ASSOCIATION

of America

134 So. LaSalle St., Chicago 3, Illinois
Tel. Andover 2664

Write Manager, Hotel Sherman for Room Reservations NOW

Maintain

LOW COST MATERIALS FLOW WITH *Performance-Proven* SHOP MULES

Hebard A3V-U2 Shop Mule tows up to 25 ton loads

HEBARD SHOP MULES *move materials* faster! They lighten the load for your men and keep machines busy by ensuring steady delivery of material and prompt hauling away of finished work. From receiving platform, all along the processing route to shipping dock . . . SHOP MULES accelerate production and help trim costs for countless industries. They multiply the economies of the Pallet System by keeping Fork Lift Trucks busy raising and lowering loads . . . while SHOP MULES haul and deliver at lowest cost. One of the many models will meet your needs.

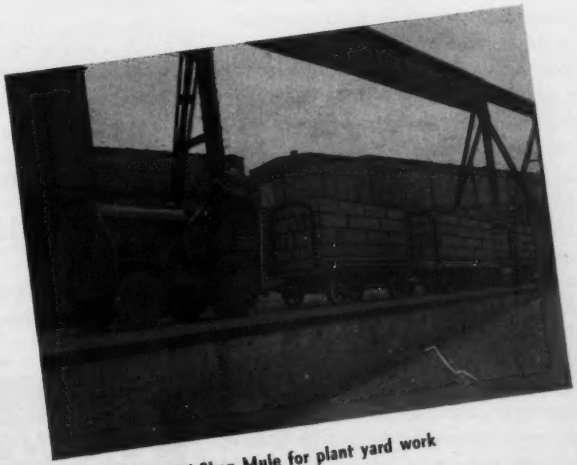
WRITE FOR CATALOG FA

W. F. HEBARD & CO.

2433 SOUTH STATE STREET
CHICAGO 16, ILLINOIS

SHOP MULE INDUSTRIAL TRACTORS

ALL HEBARD SHOP MULES ARE INTERNATIONAL HARVESTER POWERED WITH PARTS AND SERVICE AVAILABLE ALL OVER THE WORLD. LIGHT AND HEAVY DUTY SHOP MULES FOR FACTORIES, WAREHOUSES, RAILROADS, AIRPORTS, MARINE TERMINALS, etc. SNOW PLOW, WINCH, WELDING, AND ROTARY SWEEPER BROOM ATTACHMENTS.



Hebard A14V Shop Mule for plant yard work

the sum of individual contributions is not impaired by weak links in the chain.

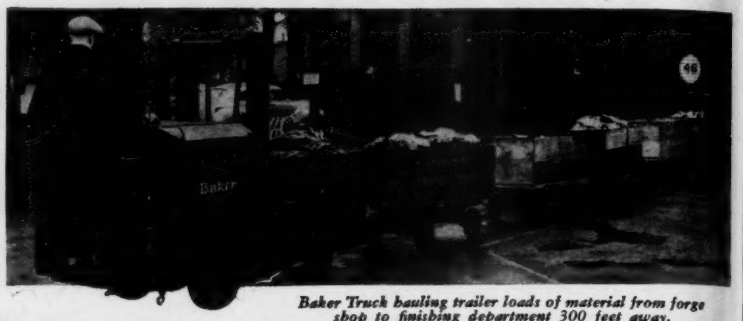
We all know of industrial plants where maximum productivity seems to have been attained, to the advantage of management, stockholders, and employees—also to the advantage of consumers of their products. They are generally plants where every employee—whether plant superintendent, office worker, foreman, machine operative, truckman, or porter—seems to be concerned with avoiding waste, with suggesting time-saving or labor-saving improvements, with increasing the total productivity. *There is some powerful incentive present.* It may be a system of incentive pay or bonuses, or a sense of participation cultivated otherwise, or group leadership intelligently encouraged, or confidence in the purposes and policies of management, or a combination of them.

Such management is aware of efficiency or inefficiency in the handling of materials at every stage, of both the human and the mechanical problems involved, and knows how to keep this vital link in the productive and distributive processes as strong as the other links in the chain.

Industrial Engineering

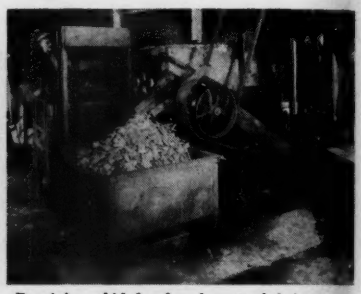
The Materials Handling Division of the A.S.M.E. has already made a valuable contribution to industrial progress by its studies and conferences and reports on this important phase of production and distribution. It has a great opportunity ahead, in pushing forward the movement it has helped to start. Economic waste in handling materials cannot be tolerated if our industries are to produce more goods for more people at prices customers can afford to pay. *The higher wages that workers are seeking can be paid only on the basis of increased productivity. Industry must do its utmost to help its workers, with adequate equipment and time-saving procedures, to produce more with less physical effort. With mechanical power available for so many purposes and the possibilities of voluntary cooperation under intelligent leadership so frequently demonstrated, we know how to bring about an economy of abundance.*

Baker Truck releases 23 men from handling for productive work



Baker Truck hauling trailer loads of material from forge shop to finishing department 300 feet away.

Unloading skid boxes of blanks shipped in highway trucks from other plants.



Receiving skid loads of material from blanking press for delivery to next process.

A single Baker Hy-Lift Truck forms the basis of a system for the unit-load handling of material through production, which helps a manufacturer of garden tools meet today's need for lower production costs.

The combination of the Baker Truck and a new floor in the plant released for other work a gang of 23 men and a foreman previously required to keep work moving by hand methods . . . Later, additional savings were made by adding trailers for inter-plant handling. Trailers also solved the problem of moving loads of material on and off elevators with insufficient capacity for loaded trucks . . . The truck also simplified changing of dies and delivery of heavy equipment to and from maintenance department.

If lowering production costs to meet price ceilings is your problem, Baker Trucks may provide the answer. Consult your nearest Baker representative or write us direct.

BAKER INDUSTRIAL TRUCK DIVISION

of the Baker-Raulang Company

2185 WEST 25TH STREET • CLEVELAND, OHIO

In Canada: Railway and Power Engineering Corporation, Ltd.

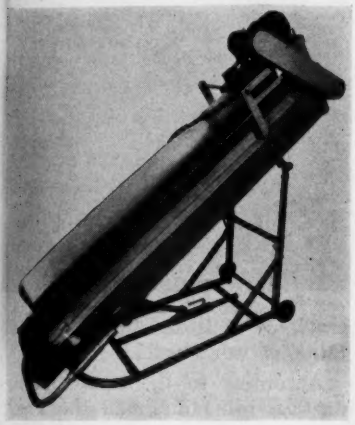
Member: Electric Industrial Truck Association

Baker INDUSTRIAL TRUCKS

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13.

PRESS ROOM BELT CONVEYOR

A PORTABLE, power-driven, endless belt conveyor has been designed by the Rapids-Standard Co., Inc., Grand Rapids, Mich., to withstand the abuse of press room operation. Called the "Press-Veyor", it is said to be compact and constructed of heavy gauge steel and steel tubing. The wide base provides stability and eliminates the hazard of tipping. According to the company, the two-wheel design of the base allows the "Press-Veyor" to be moved easily. The belt is constructed of 32-ounce, four-ply canvas, stitched with heavy twine and impregnated to make it pliable, waterproof and weatherproof.



TOTE BOX ROLLER

ROLOCK, INC., Fairfield, Conn., has introduced a tote box "handi-roller", which is designed to save time and energy in moving boxes containing compact, heavy loads of metal parts around the shop. It consists of a small metal frame that holds two sets of ball bearing rollers, one on which the load rests and another set that rolls it to its destination. A traction hook fits through any one of a series of holes in the shoulder-high handle to accommodate height of box or boxes to be rolled onto the frame. By slipping the traction hook into the box handle and pulling back, the tote box is brought over the beveled edge of the frame and up onto the rollers.

ADJUSTABLE SHELVING

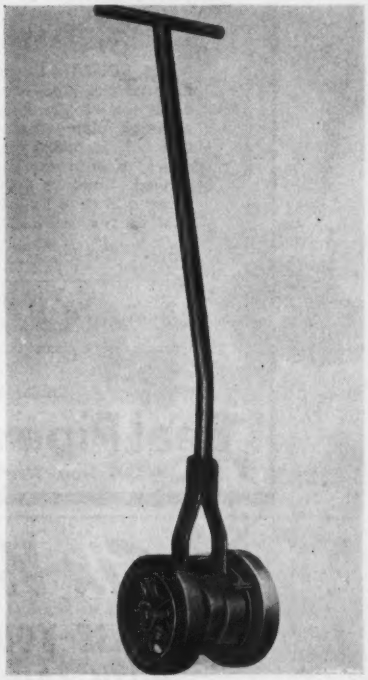
ADJUSTABLE shelving manufactured by the Unistrut Products Co., Chicago, comes in four sizes of cross members, a maximum of 20 feet in height and in any length. The photo shows samples of 3′ x 12′ overall and 3′ x 4′ sections in the foreground. The background is 3′ x 8′ overall. According to the company, the load without deflection is 100 pounds per square foot.

STORAGE RACKS

Econo-Racks made in a variety of sizes, lengths and heights to fit specific conditions are being manufactured by the Abell-Howe Co., Chicago. Liner pans can be furnished when continuous bearing of delicate materials stored is desirable. According to the company, a space 10′ x 14′ x 10′ will store 100 tons of steel bars. Econo-Racks are said to permit free passage of air and to lend themselves to air-conditioning of materials.

LIFT JACKS AND PLATFORMS

THE new Clark lift jack manufactured by the All Steel Welded Truck Corp., Rockford, Ill., is said to require 76 pounds handle pressure to raise a 6000-pound distributed load on a 60-inch platform. According to the company, the lift jack weighs 42 pounds and will engage and disengage in 12-inch operating space. The lift jack includes semi-steel or molded-on rubber-tired wheels, complete with roller bearings, Zerk grease fittings and spring handle hold-up as standard equipment. Clark semi-live skid platforms can be supplied with any type deck or super-structure.



STEEL SHELF TRUCK

A steel shelf truck produced by the Re-Bo Manufacturing Co., Inc., is a handy utility truck for factories, shipping rooms, general purposes or for handling small parts in machine shops. The width is 24 inches, depth 18 inches and overall height 35 inches. According to the company, the truck can be furnished in other sizes according to the needs of the customer. Re-Bo

Handling Pipe and Flat Crates in a Metal Warehouse.

Specially Designed to Handle Long, Awkward Flat Loads

The ROL-AWAY enables one man to move long, flat material and pipe—with ease and safety—doing jobs ordinarily requiring three or four men. Ideal for flat metal plates, plywood, plate glass, pipe, tubing and large flat crated material. No lifting required to load or unload. Saves floor space—rolls in any direction—much faster than *any* other method. Capacity 2400 lbs.—weight only 64 pounds. Rol-away will save its low cost in a few days time. Get the facts on this time and labor saving truck, NOW.

Send for Free Illustrated Folder TODAY!

The ROL-AWAY

Dealer Franchises Available

Beal Pipe and Tank Corp.

2101 South West Jefferson Ave., Portland, Ore.

Six Ways to

INCREASE YOUR FLOOR SPACE WITH SKID PLATFORMS, SEMI-LIVE SKIDS & FLOOR TRUCKS

1. **Tier loaded skids in out of way places.**
2. **Use semi-live skids to hasten car and truck loadings.**
3. **Install specially designed production-line skids to speed handling.**
4. **Use specially designed super structure units to handle two or three times as much.**
5. **Two or three conveniently "spotted" lift jacks will handle many semi-live skids—therefore save room.**
6. **Use removable-shelf floor trucks for parts usually piled on work tables.**

The faster a job is finished the faster it will be out of the way —on its way to the consumer.

Write for illustrated literature on Ironbound: 1. Cost saving, 2. Labor saving, 3. Space saving materials handling equipment.

IRONBOUND BOX & LUMBER CO., 30 Hoffman Place, HILLSIDE, N. J.

Ironbound MATERIALS HANDLING DIVISION

recently relocated its plant from Knoxville, Tenn., to Bedford, Va., where it now occupies the former Continental Can Co. property.

DUMPER AND TRANSFER TABLE

DESIGNED originally for use in newspaper composing rooms, the Lewis Shepard multi-purpose dump truck is being found useful in many industrial plants. In its lowered position, with the flat table top in place, newspapers use the

truck as a turtle table, transfer table, or work bench.

According to the company, industries using dies find the truck

handy for carrying the dies from storage to presses. Lowered height of the table top is 36 inches. Table top may be raised six inches to take care of variations in press height. Dumping takes place automatically as the bin is lifted to dumping height. Lifting is accomplished hydraulically by means of a pedal.

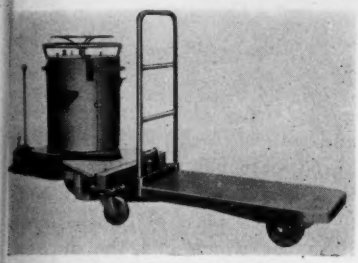
SELF-DUMPING ELEVATOR

A self-dumping elevator built to customer's requirements has been

announced by the Mansaver Division of the J-B Engineering Sales Co., New Haven, Conn. According to the company, material may be dumped into the bucket at floor level and from bucket at dumping level. If material is in barrels, complete barrels may be dumped. Hoists may be supplied by customer or designs are available with built-in hoists and fully automatic operation.

TURRET TRUCKS

The Salsbury turret truck with automatic clutch and transmission is now being manufactured and distributed in the United States and

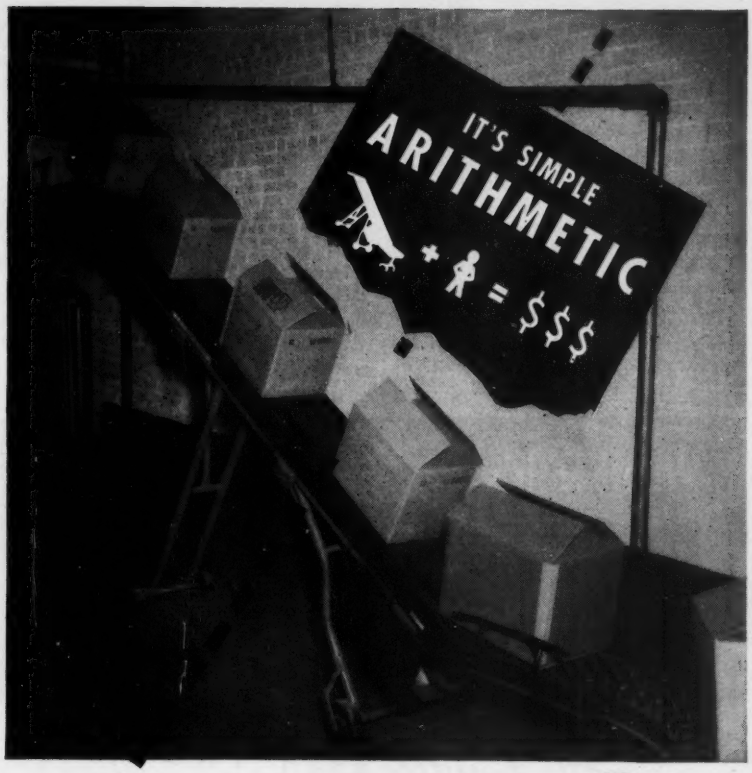


Canada by the Nutting Truck and Caster Co., Faribault, Minn. Models include the lift, tractor and cargo type. According to the company, the complete power unit is in the turret. It is equipped with heavy-duty, internal expanding, two-shoe constructed brakes.

ARTICULATED FORK TRUCK

The Baker Industrial Truck Division of the Baker-Rauland Co., Cleveland, has developed a new

4000 lb. capacity truck known as the Type AIMH articulated fork truck, which is designed primarily for warehouse operation. According to the company, the unit features a new method of steering by "articulating" the frame, permitting swinging the load to line it up in position without lining up the truck itself.



THE Stevedore, Jr.

ADDS PROFIT
DIVIDES HANDLING TIME
MULTIPLIES MANPOWER
SUBTRACTS FATIGUE

The Stevedore, Jr. plus one man = increased production and more profits.

This combination of a Stevedore, Jr. and one or two men does the work of ten men in less handling time and with less fatigue.

Useful in loading — or unloading — trucks and cars . . . in low stacking operations . . . in a gravity conveyor line as a "booster" or "pusher."

The Stevedore, Jr. — portable, power belt conveyor . . . easily moved from one job to another.

. . . Adjustable Rapid-Lock Supports — from 18" horizontal level to 72" delivery height.

. . . Will lift 225 lbs. of distributed load weight at the rate of 50' per minute.

. . . Plugs into standard 110-volt lighting circuit.

IT COSTS NOTHING TO GET FULL PARTICULARS
WRITE TODAY FOR FREE LITERATURE

OFFICES IN PRINCIPAL CITIES

Manufacturers of
STEEL FORGED CASTERS · TRUCKS · CONVEYORS · POWER BOOSTERS

The Rapids-Standard Co., Inc.

Sales Division—377 Peoples National Bank Bldg., Grand Rapids 2, Michigan

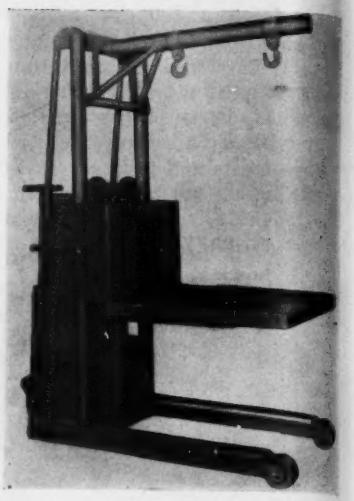
PLATFORM TRUCK

THE Buda Model HB Chore Boy is a dual wheel, heavy duty platform type truck of one-ton capacity. According to the company, it has the same features as the FF model except that its wheel base is shorter, permitting turning in narrower aisles. In addition, more traction effort is claimed for this model. It weighs 1000 pounds, is equipped with 7.7 air-cooled four-cycle engine and is capable of speeds up to 15 miles per hour.

DIE SEPARATOR

SINCE a use of its 2000-pound capacity high-lift truck is in die handling operations, Lyon-Raymond Corp., Greene, N. Y., now offers optional features designed with this application in mind. The die separator consists of a removable boom with adjustable hooks. The top section of a die is fastened by chains to the hooks and the lowering of the platform accomplishes the separation of the two sections of a die. The boom is a "hook-over" type requiring no bolts for attachment.

For pulling dies and fixtures in



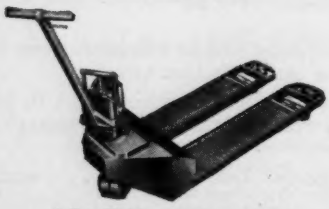
and out of racks and presses, a gear type winch with a ratio of 38 to 1 is also available. This bolts to the back plate of the platform. Both the winch and the die separator may be furnished with a standard model truck or added to it after it is in use.

Whether it's a ✓SKID LOAD or a ✓PALLET LOAD...

You can handle it quickly, easily and cheaply with a

LYON-Raymond Hydraulic LIFT TRUCK

Platform Model for Skid Loads—All sizes and capacities.



Pallet Model, several capacities—for single or two-faced pallets.

Check These SUPERIOR FEATURES

- Fingertip lowering control.
- High underclearance—due to single frame construction.
- Self-contained Hydraulic Pump and Ram.
- 360° Turning and Operating Radius.
- One-piece, all-welded, steel frame.
- Timken Bearings in all wheels.

Here are the two most versatile trucks you could have in your plant. Useful in almost every department, or for inter-department transport. For servicing from storage alleys to main arteries, their size, easy maneuverability, design, and construction features fit the job perfectly. They'll pay for themselves quickly—and pay a profit for years to come!

• Ask for bulletin describing these trucks—Consult us on your Material Handling Problems.

LYON-Raymond CORPORATION

489 Madison St. Greene, N. Y.

LYON-Raymond Corporation
489 Madison St., Greene, N. Y.

Send me your Bulletin #127 on the Platform Model Truck
Bulletin #132 on the Pallet Model Truck

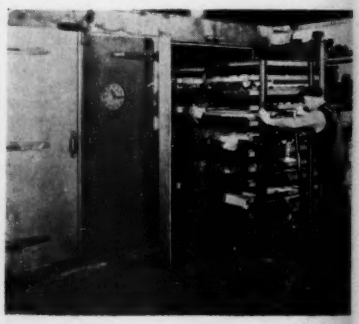
Company.....

Individual..... Title.....

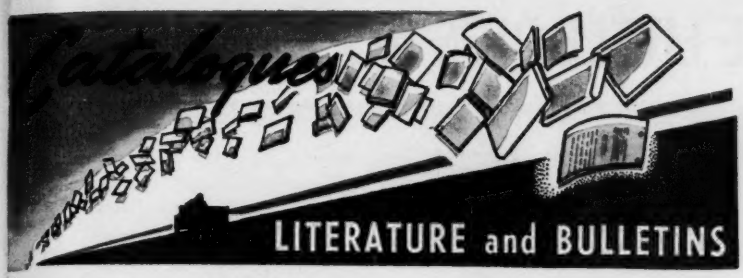
Street..... City..... State.....

CORE-BAKING OVEN

A NEW batch type core-baking oven, produced by the Despatch Oven Co., Minneapolis, Minn., provides uniformity of bak-



ing cores and molds and increased capacity and speed of baking, according to an announcement from the company. Other features are ease of installation, cleanliness of cores and core room, and automatic devices which are said to make baking operations easy and safe. The ovens are available in 64 standard models to handle cores or molds of all sizes.



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

135—Hand Trucks . . . A two-page release describing the uses and features of a steel, all-welded hand truck made by the Schmidgall Manufacturing Co.

136—Lifting and Tractor Equipment . . . Three illustrated folders about material handling equipment manufactured by the Hyster Co. One deals with machinery for the general contractor and includes discussions about towing winches, double drum donkeys for hoist service, tractor cranes for lifting jobs and the Hystaway, a tractor mounted dragline, clamshell and crane unit that mounts and operates in conjunction with a bulldozer. The other two bulletins are concerned with lift and straddle trucks as well as accessories for this equipment.

137—Electric Industrial Trucks . . . A 56-page illustrated material handling handbook of the Electric Industrial Truck Association, republished with minor changes. The four sections deal with management's responsibility, truck handling systems and costs, direct and indirect, methods for organizing a material handling system and battery capacities. The appendix covers floor loads, protection against fires and explosions and auxiliary equipment.

138—Handling Glassware . . . Material handling in glassware manufacturing is discussed in a two-page folder entitled "Getting a Break." Illustrations of the equipment used and their applications are included. A presentation of the G. B. Lewis Co.

139—Industrial Floor Machines . . . Illustrated two-color bulletin describing electric, self-propelling floor machines with 12-inch drum-type accessories. Applications include removing grime, dry cleaning, sweeping, polishing, burnishing and sanding industrial floors. A publication of the G. H. Tennant Co.

140—Floor Cranes . . . An eight-page folder about power operated and hand model floor cranes manufactured by the Ruger Equipment Co. A list of specifications is included along with two full pages of illustrated applications. Wheels sizes and custom models are discussed.

141—Tramrail Systems . . . A 12-page bulletin, issued by the Forker Corp., presents details about tramrail systems, fittings and accessories. A discussion of the "Principles of Materials Handling" and "How to Recognize High Handling Costs" is included. Sections of the folder are concerned with teerail sections, ceiling fittings, below-the-hook devices, beamrails, tramrail electrification, switches, standard yoke assembly, hand-propelled trolleys and tramrail cranes.

142—Elevating Conveying Equipment . . . Thirty-two page illustrated catalog presented by the Jeffrey Manufacturing Co. Among the handling equipment covered are elevating machinery, conveyors, barrel packers, car pullers and electrical controls. The presentation also covers processing equipment produced by the company.

143—Motor Generators . . . A brochure released by the Motor Generator Corp., a division of the Hobart Brothers Co. A special design motor generator for charging electric industrial truck batteries, a gas drive portable generator of two circuit type for charging railway coach batteries, and a gas engine drive DC generator for magnetic crane service are among the products illustrated.

144—Handling and Storage Equipment . . . A vest pocket size catalog of 148 pages presented by the Barrett-Cravens Co. The line includes hand lift trucks and skids, powered lift trucks, die lifting tables, portable elevators and cranes, barrel and skid storage racks, two and four-wheel trucks. Applications, operations, construction and dimensions are discussed.

145—Processing Carriers . . . Processing carriers that are custom-built for the specific job are the subject of a four page illustrated folder presented by Rolock, Inc. Many types of industrial baskets, crates, trays, racks and fixtures are described in detail.

146—Trucks, Wheels and Casters. . . A 12-page catalog of products presented by the Morris Truck and Wheel Co. Illustrations are included of hand trucks for use in warehouses, factories, mill or die houses and packing houses. Dimensions and specifications are given for various casters and wheels.

147—Shop Mule Tractor . . . An illustrated folder showing features and applications of the Hebard Model J233 Deluxe Airport Shop Mule Tractor. The presentation deals with specific applications in airports. A page of specifications for the heavy duty type is included.

148—Turret Trucks . . . A six-page folder about Salsbury turret trucks with automatic clutch and transmission. Lift, tractor and cargo types are discussed and illustrated, including articulated design, automotive type brakes and power unit specifications.

149—Pressed-Steel Hand Trucks. . . A 20-page catalog presented by the American Pulley Co., manufacturers of pressed-steel trucks and industrial truck wheels. Many types of hand trucks are illustrated; engineering data are given.

150—Clamp Trucks and Accordian Conveyors . . . Two folders presented by the Food Machinery Corp. The one on clamp trucks illustrates and describes three different models, and gives features and instructions on operation. The conveyor folder pictures the extensible, collapsible, flexible and portable equipment in various positions. Information on design, construction and applications are given.

OPPORTUNITIES

Men wanted Jobs wanted Lines available

RATES: minimum, 25 words, $2.00; each additional word, 10c. Bold type or all capitals: minimum, 25 words, $3.00, additional words, 15c. All insertions are payable in advance.

"LINES WANTED"

Manufacturers Representative, kind that makes personal contact, men Seattle, San Francisco, Oakland, Los Angeles, San Diego, want lines Production and Material Handling Equipment only exclusive representation for entire coast states considered. Bordeaux Engineering Co., Trans-America Bldg. Los Angeles, (14).

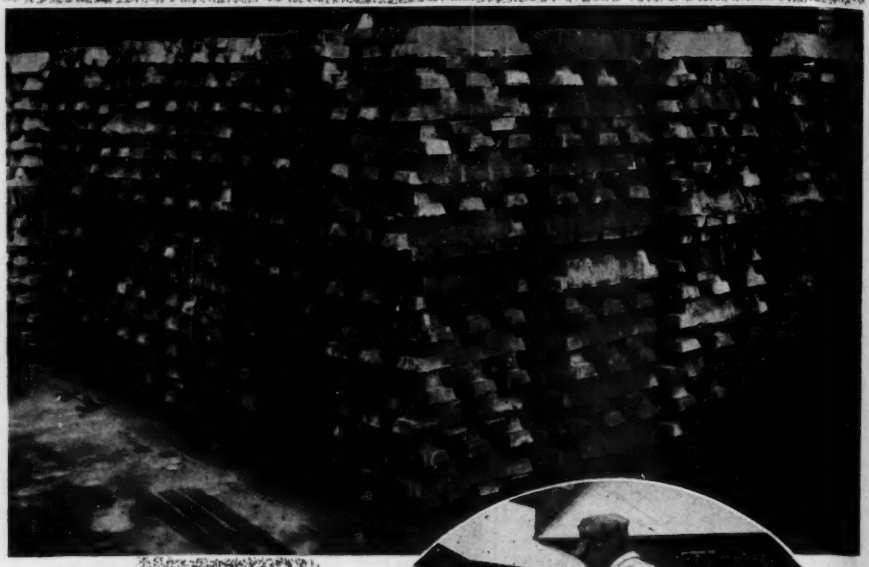
An engineering sales company with offices in Houston, Dallas, San Antonio and New Orleans, will consider distributorship of any good handling equipment, or mechanical devices that can be sold on exclusive basis to manufacturers and machine shops in these areas. Box 4246, FLOW.

Firm of sales engineers specializing in materials handling equipment for the past twenty years are desirous of adding one or two items to their line. Box 4546, FLOW.

JOBS WANTED

10 years experience with industrial trucks, 4 years experience as material handling foreman, direct supervision over 40 employees, assisted in planning and systemizing. Instructed and trained industrial truck operators, also interested in industrial truck sales work. Box 4346, FLOW.

THESE LITTLE PIGS GO TO MARKET



More than 5,000 lead pigs, weighing over a half million pounds, were moved and tiered by one truck operation in only four hours and 15 minutes, photo above.

Lead pigs are cast with a lip on each end, permitting numerous stacked units to be handled and tiered like palletized lead, without pallets.

One operator transfers and stores 125,000 pounds of lead per hour.

SINCE the days of P.W.A. and W.P.A. it is rare to find anyone who wants to tackle the back-breaking job of picking up, carrying and stacking 100-pound pigs of lead all day long. As long as the job can be performed mechanically, why not let men direct power and accomplish more work with considerably less effort and accident hazard?

It so happens that lead pigs are cast with a lip on each end; and if a row of pigs is laid uniformly alongside of one another, the lot can be readily picked up by entering the forks of a fork lift truck under the lips. By placing five in a layer, inverting every other pig in all but the bottom layer, and stacking eight layers high, criss-crossing each layer, a most compact unit load of approximately 4,000 pounds results. This load if carefully stacked can be rehandled and tiered just as palletized unit loads are handled.

There are many large consumers of lead in this country. Practically all are situated on railroad sidings and many are either on inland waterways or within trucking distance of these waterways serving producers of lead. The only difference existing between the two modes of shipment is that four bands of either round steel wire or flat steel strapping are required for a stack of pigs for rail shipment. The stacks may remain intact for water shipments without any binding.

Actually the record performance briefly cited above was just one phase of a well studied and coordinated operation. The pigs were stacked once after being cast, were then placed on small flat cars two units high and moved to the dock. Then a crane boom equipped with a cable sling picked the two units up and placed them in the hold of a seagoing barge. It was possible to swing the hook so that they could be spotted without any re-handling. The cargo being so heavy, the maximum weight was reached by utilizing but a relatively small percentage of the available cube. In this way plenty of room could be allowed for releasing and placing slings in the proper position. Upon arrival at destination the barge was unloaded in the same manner by reversing the operation. Then, for two reasons, it was found advisable to set the double unit load down and handle each 4,000 pound unit separately when placing it on the flatbed highway trailer for the haul

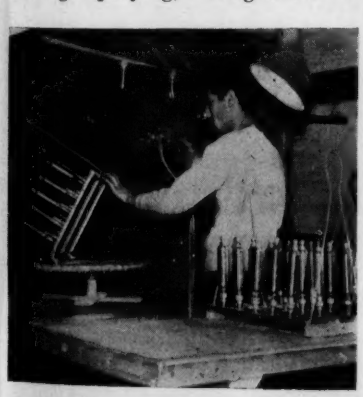
to the consumer's plant. First, 8,000 pounds were too heavy to place in one spot on a vehicle equipped with springs and, second, the loads could be properly spotted on the trailer in less time with a fork truck working from either side, or both sides at once with two fork trucks. And then the units would be more easily removed in the same manner at destination.

At the unloading point one operator with a 4,000-pound capacity fork truck unloaded 5,058 pigs weighing 500,079 pounds from trailers, transferred them an average distance of 75 feet and double tiered them in storage, as shown in the illustration, in an elapsed time of 4 hours and 15 minutes. There was a delay of about 20 minutes in the entire operation due to a tie-up of one of the trailers while in transit. This operation represented almost perfect coordination by means of balancing labor and equipment. The savings, which are quite obvious, represented almost 90% of the method formerly employed.

Some other metals, such as tin and antimony, are so cast that they lend themselves to mechanical handling. It would be well for all producers of metal to give consideration to the handling of their products, particularly where each individual shape presents a handling problem.

HANDY TRAYS FOR SMALL UNITS

SMALL dryers for moisture absorption in commercial refrigerators are handled in multi-unit lots through spraying, baking and cooling operations at the Weatherhead Co., Cleveland. This is accomplished by means of specially designed tray which makes it unnecessary to rehandle the individual units.



This tray or rack, developed by the company's engineers, consists of three 18″ flat steel bars welded over two 12″ pieces of the same stock. Hooks, about 18″ in length, are soldered on each end and serve as connectors to an overhead chain conveyor. Fifteen dryers are placed on each rack and fit on pegs welded to the bars. While this multi-unit method is used for the smallest sized dryers, larger ones are handled individually.

Spraying is done on a turntable inside the spray booth. Upon completion, the loaded racks are hung on the hooks of the conveyor, which dips conveniently to working height at the loading point. From here the line inclines 12 feet above floor level, and the product then enters the infra-red ray oven. (Baking is necessary to take the moisture out of the silica gel which is contained in the units.) The oven, about 30 feet long and three feet deep, is installed at a sufficient height to permit use of the floor area underneath.

After leaving the oven, the conveyor makes two 90° turns and then dips at the final work station for removal of the units. The empty trays are returned to the spray booth area for reuse.

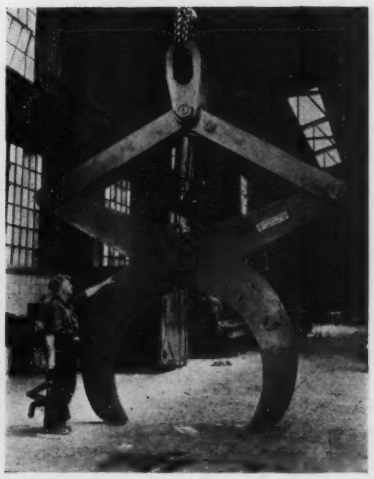
The conveyor travels at a speed so regulated that the units are properly baked and atmospherically cooled to a temperature convenient for handling at the end of the line. Here a final sealing operation must be performed while the unit is still warm enough to resist moisture when exposed to the air.

The line of travel from the spray booth to packing is a distance of about 150 feet, and many hundreds of dryers pass through this compact department every hour.

DAVID AND GOLIATH

THESE two automatic tongs are designed to lift material weighing from 20 pounds to 20 tons. The models illustrated are equipped with a mechanism called the "mechanical brain." It opens, closes and locks the tongs without a finger being laid upon them, a button pushed, or a lanyard yanked.

When the tong is dropped with open jaws on an ingot, axle, machine or bale, the mechanism causes the jaws to release over the load. As the operator starts to lift, the tong jaws grip the material and hold it while being transported to the desired location. As it is deposited, the "mechanical brain" opens the tongs and locks them open, awaiting the next job.—*Courtesy, The Heppenstall Co.*



How Ohio Rubber Co. Solves Its

DIVERSE HANDLING PROBLEMS

Area alongside warehouse buildings is used for storage of pallets, photo above.

●

Slabs of synthetic rubber are tiered by inserting long 2" x 6" ties between loads, right.

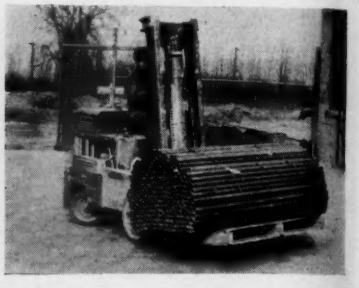
A regular program of planning for improvements is a main feature of operations at Ohio Rubber Co., which handles a large variety of raw materials and finished products.

PLANNING and improving methods are as important as the actual material handling operations at the Ohio Rubber Co., Willoughby, Ohio.

Storage is scheduled in the central office of the warehouse and material handling department, where the department superintendent coordinates handling activities involved in storing raw material and in removing it to production lines. He is aided in these activities by the trucking foreman who directly supervises the activities of all truck operators and of others involved in moving, loading and unloading operations. Together with the safety committee, the department superintendent and the trucking foreman inspect all aisles, check them for possible hazards, and determine solutions whenever congested areas develop. They also determine how material shall be handled.

●

"Palletized" load of tubes with vertical supports and straps is ready to be tiered.



Long lengths of steel tubes are wired together and transported by fork lift truck.

Control Boards Are Used

The installation of a warehouse control board has aided the company in maintaining a constant and economical flow of incoming and outgoing materials. This board is divided into 48 squares, and each square, representing a bay in the storage area, contains six pegs. On each peg are threaded small cardboard tickets listing the product number, weight or amount, and other necessary information about

●

Rubber mats come by conveyor from another building and are assembled in unit loads.

the material stored in that section of the bay. If one item is tiered above another, its ticket is placed on the same peg as the first. The board thus gives the warehouse superintendent visual control. When a new load comes in, he knows immediately where space is available. A load sheet is made out listing the product number, the letter and number of the bay, and the lot number assigned. (The lot number determines the order in which material will be subsequently withdrawn from stock.)

Two copies are made of the load sheet. One remains in the superintendent's office and is used to enter information on the tickets for the control board. The second copy is routed to the trucking foreman. After the handling crew has completed the job, this copy is returned to the central office. As goods are withdrawn for production purposes, the same procedure is followed and the control tickets are reduced accordingly. It is possible, therefore, to write up a complete inventory of all material in storage in a short time.

Allocation of Trucks

The trucking foreman also makes use of a control board in making assignments to the various truck operators. The squares on this board represent the different trucks operated by the company. Tickets of three different colors are used—one for each shift. When the truck operator comes on duty, he takes the ticket bearing his number. This contains information as to the department, departments or areas to which he has been assigned and, in some cases, the products to be moved or stored. The truck he will use is determined by the number on the square to which his ticket has been pegged.

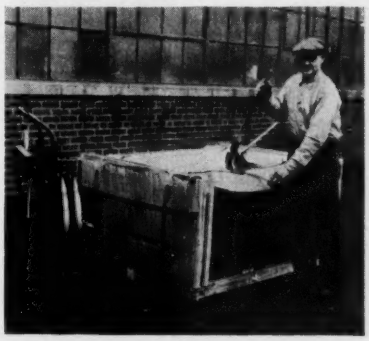
The drivers who are assigned to a specific department are directed in their activities by the foreman of that department. As far as the actual operation of the truck is concerned, however, the driver is responsible to the trucking foreman. Where handling tasks arise which have not been scheduled on the control board, the foreman in the department concerned phones the trucking foreman, who makes the necessary assignments.

Altogether, the company makes use of more than 40 powered industrial trucks, along with 35 hand trucks for short moves, and a conveyor system that will be discussed later.

Variations in the products have necessitated changes in layout from time to time. As these changes take place, certain departments or areas may require more or less mechanical handling equipment. In order to check on the use of mobile equipment by a department, a service recorder is used. A small circular chart, divided into two-minute sections, is marked by a needle when the truck is operating. If the truck is not used, empty spaces will appear on the chart. At the end of each shift, the chart is removed and actual running time is entered on a control sheet. If the department to which the truck is assigned shows little use during an eight-hour period, and this happens repeatedly, relocation of the truck or assignment.

Use of Unit Loads

Pallets or skids are in general use throughout the plant in moving material from work station to work station. Raw material that does not arrive palletized is made into unit loads whenever possible. The unit load principal is widely applied through processing and assembly. A pallet load of raw material becomes a skid load of work-in-process after the first operation. It may be taken from the skid and



Portable stand containing drums of strap, tools and fasteners is used in strapping.

then travel by conveyor as an individual unit, but when skidded again, assembly of the unit load takes place.

Many products are strapped or wired on pallets for rapid handling and protection against loss or damage. Handling of many individual packages through sorting, loading and unloading is thus

Drive screw nails secure anchor plates in studding at rear end of the freight car.

avoided. Whenever possible, loads for shipment are also palletized and strapped.

Corrugated or fibre board usually is placed over the load to protect the corners and edges of the products during shipment. Vertical supports are sometimes nailed to all four corners of the pallet, and at the top of the supports slots are cut through which the strapping passes and is held in place.

The major portion of palletized shipments involve preliminary preparations of the freight car with steel strapping. Layout crews prepare empty cars spotted adjacent to the loading platform. In some cars, stringers reinforce the side walls and short pieces of 2" x 10" reinforce the end wall. Drive screw nails secure anchor plates in the studdings at the rear end of the car. The steel bands are threaded through these plates, and staples hold the row of strap against the side walls of the car. Thus the strap cannot snag packages and is out of the way of the truck operator during loading operations. Some dunnage and bracing are also used.

New Methods Pay Dividends

Company personnel are constantly experimenting with new methods of loading. Heavy drums of chemicals and oils were formerly handled individually and stored in one layer. Today they are palletized and double tiered. The new

The

"LITTLE HUSTLER"

TRANSFERS STAMPINGS AS FAST AS PRODUCED!

The "Little Hustler" is fully portable and quickly adjustable to a wide range of applications. The 8 foot size shown above has a maximum delivery height of 81 inches at 45° and 50 inches in a horizontal position. It is made in 13 models to handle any size stamping up to a 24 inch width.

For further information, write for descriptive folder. Inquiries on permanent conveyors and special purpose equipment solicited.

MAY-FRAN ENGINEERING, INC.
Development Engineering and Manufacturing
1710 Clarkstone Rd. Cleveland Ohio

TOWSLEY

SPECIAL TRUCKS

engineered and produced to customers' individual requirements, are effecting appreciable savings over trucks commonly used. . . . Perhaps special trucks, designed by us for you, can cut your materials handling costs.

Why not put it up to Towsley?

TOWSLEY TRUCKS, INC.
1770 Elmore St. Cincinnati 25, O.

method not only makes use of overhead space, but also makes the drums more accessible. A carload of drums, under the old method, required three men two days to unload and store. Today, two men and a fork lift truck operator perform the same operation in six hours.

Coils of wire, slabs of synthetic rubber, short lengths of round steel tubing, angles, steel frames, rolls of felt and drums of scrap are some of the raw materials which are now placed on pallets and tiered in the warehouses. Some of these products have a tendency to sag and others, because of their odd shapes, will not support the flat undersurface of the pallet tiered on top.

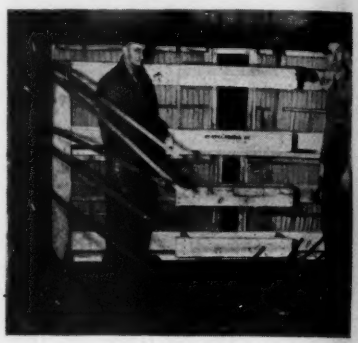
A number of devices have been used to overcome this. Slabs of synthetic rubber are piled pinwheel fashion on the pallet. Long 2" x 6" ties support the second and third rows of pallets. These stringers take care of the tendency of the material to settle. Only one tie, long enough to extend over four loaded pallets, is necessary between tiers. The solution of this problem meant a saving of one day in unloading a 50-ton car of rubber. By being able to palletize and stack, the new method requires two men and a truck operator one day to unload, as compared with four men and two days under the old method. Labor thus saved was made available for productive purposes.

A solution to the handling of steel tubes on pallets was found by strapping the tubes together. For tiering purposes, dunnage was added between layers, making it possible for the round shapes to support the flat bottom of the pallet above. Strapping is used also for palletizing felt.

Solving Layout Problems

The variety of products manufactured at the Ohio Rubber Company makes frequent changes in layout necessary. Six buildings, (one three-story and five one-story) house production processes. Often, through a given aisle, truck traffic will be abnormally heavy. It is desirable in such cases to reduce this traffic and transport material by other means, if possible. With this in mind, a system of overhead chain conveyors has been installed in and between buildings. In most cases, the company engineers have routed these conveyors so that maximum possible use may be made of the facilities.

An example of their use is found in the manufacture of automobile floor mats. Raw materials for these is compounded, rolled out, cut to size and formed in presses in one building. Because there is insufficient space to continue the line here, the product is moved by overhead conveyor into another building. This has proved especially effective since the connecting aisle between the two buildings is already heavily travelled.



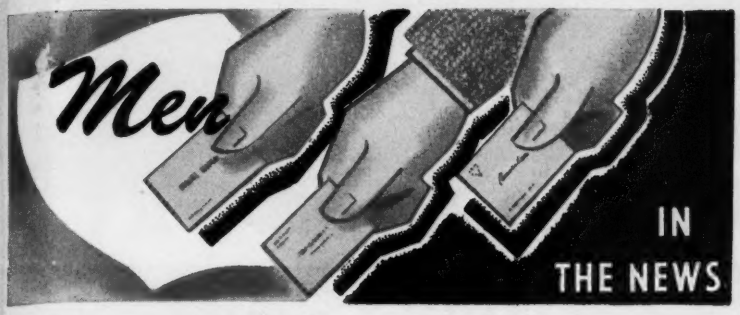
Layout crew straps bracing and dunnage between tiered palletized loads in car.

The progressive system for controlling material movement at Ohio Rubber is constantly being revised under the direction of the material handling superintendent and the trucking department foreman. Unit loads are handled whenever practical. Material not palletized or skidded is studied for possible improvement. Forms and control sheets are designed to meet specific product needs. At present, the load sheet is being redrawn and columns for additional information are being added.

The executive personnel are constantly in search of the best possible handling methods. The result is regular improvement, reduction in handling costs, and more efficient production effort.

Address all inquiries to Flow at our new address—

1240 Ontario St.
Cleveland 13, Ohio



GEORGE R. BROCKWAY has been named to the new post of assistant sales manager of the Rapids-Standard Co., according to an announcement from L. C. Backart, president and sales manager. Brockway was formerly midwestern regional manager for the company.

A. DONALD BOWMAN, recently released from active duty with the Army Air Forces as a lieutenant-colonel, has been appointed sales representative for the state of Connecticut by Automatic Transportation Co., Chicago, it is announced by Roy L. Wolter, sales manager.

A. Donald Bowman

Bowman first joined Automatic in 1935, as a sales representative for the Waterbury, Conn., area. He left in 1942 to enter the air forces.

APPOINTMENT of William G. Miller as manager of the Headquarters Manufacturing Staff at Pittsburgh, Pa., has been announced by W. O. Lippman, assistant to the president of the Westinghouse Electric Corp.

In the new post, created to effect a closer coordination in the management service given the operating divisions, Miller will be responsible for the headquarters manufacturing activities of the equipment, manufacturing engineering, production, quality control and wage incentive departments.

MEADE JOHNSON has been appointed marketing manager of the Yale and Towne Manufacturing Co., Stamford Division. He is responsible for developing the merchandising program of the division, including all cataloguing, sales training, sales promotion, dealer displays and supervision of advertising.

GEORGE G. RODDY, former chief of the Merchandise Warehouse section of the Office of Defense Transportation, has returned to New York City as vice-president and general manager of Interlake Terminals, Inc., sales agency representing marine and railroad terminal warehouse operators.

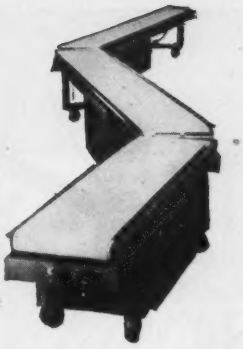
CURTIS P. WHITELEY has been named factory sales manager of the Automatic Transportation Co., Chicago, material handling equipment manufacturers and a division of the Yale and Towne Manufacturing Co.

Curtis P. Whiteley

A veteran of 15 years' leadership in material handling engineering, Whiteley moves to Automatic from the General Cable Corp., where he was co-director of material handling.

ARTHUR J. OLSEN, former district sales engineer for the Link-Belt Co., Chicago, has been appointed district sales manager at Kansas City. He succeeds Max Giffey, who has resigned after 40 years' service with the company.

Olsen has been in the employ of Link-Belt since 1918. For the past 20 years he has specialized on equipment for the meat packing and allied industries.



The Famous Powerflex

"ISLAND"

CONVEYORS

A type and size for every known use.

The Powerflex as illustrated above is a flexible belt conveyor unit which can be quickly coupled together to form any length or shape system. Speed of belts can be synchronized with a control switch at delivery end.

Package remains in center of belt without need of guides.

Portable—Low Operation Cost

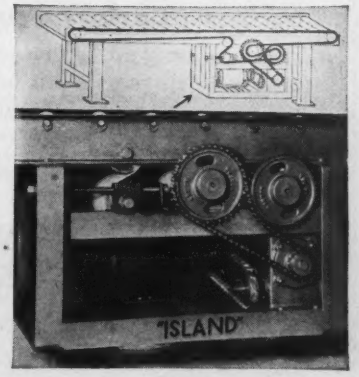
Powered by the unit shown below which is also sold by itself when needed to motorize other equipment.

Write

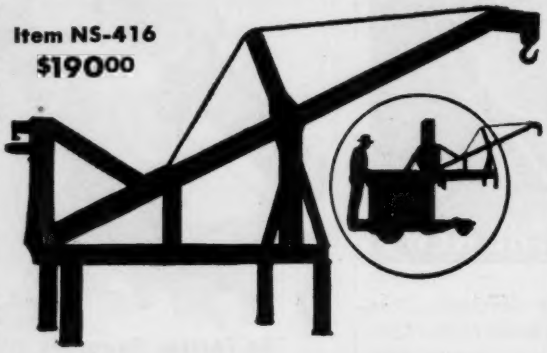
ISLAND EQUIPMENT CORPORATION

101 Park Ave., New York, N. Y.

The Powerpac Power Unit



Item NS-416
$190.00



Boom Skid *For Your Lift Truck*

Makes a "Boom" truck out of any standard high-lift truck, also made for use on fork trucks. For picking up and moving heavy objects. Made of fabricated steel, all welded construction. Capable of handling any weight load allowed by your truck balance. Boom 114" long overall, base 54" long. Legs 12" high. Weight 350 lbs. When ordering give platform or fork dimensions of your truck, also height of your platform at low position.

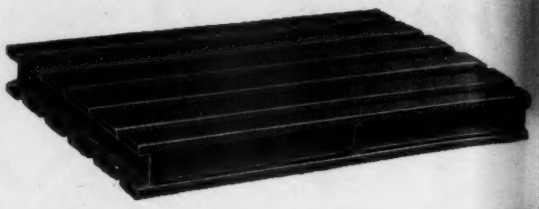
When Ordering always give "Item" number; this will help prevent error. All prices are f.o.b. Detroit.

Carboy Truck

Item B-488 **$38.00**

Roll the truck up against carboy and drop gripping yoke over the top as illustrated; then pull back on truck handles and loading becomes automatic. Hardened steel studs on the truck frame hold load in place. To unload simply tip truck forward and release gripping yoke. This truck can save a lot of dangerous, heavy lifting, avoid costly accidents, and speed up an otherwise slow and cumbersome task.

All steel welded construction. Well shaped, curved handles provide secure grip. Overall width only 20" which permits passage through narrow doorways and crowded aisles. Overall length 48" and well balanced for easy handling. Two 8" by 2" roller-bearing wheels afford easy wheeling of even the heaviest load. Capacity 500 lbs. Weight 75 lbs. Air dry enamel finish.



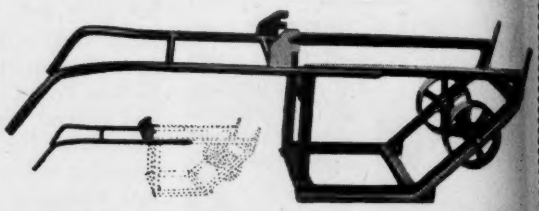
All-Metal Pallet

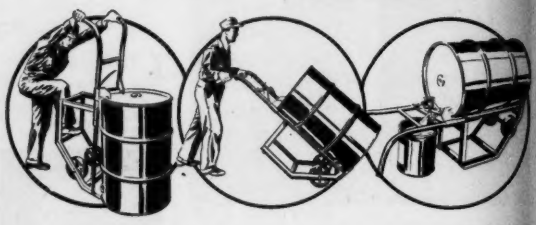
Item B-413

Above is illustrated a double faced, corrugated, special rolled steel pallet having three 3" channel separators to provide entrance for lift forks.

All Palmer-Shile Company Pallets are built to fit specific requirements or to meet buyers' specifications. Either tell us what you wish to accomplish and we will then submit our recommendations, or send us your specifications and quantity desired, on receipt of which we shall be pleased to quote you.

We build all types of pallets, any size, any capacity.





Combination Truck and Drain Rack
Loads Automatically

As truck is tilted against drum, steel fingers grip the flange at top. Loading is completed as truck is rocked back to wheeling position. Free-rolling wheels make light work of trucking the heaviest drums. Slight downward push on handles lays truck on floor with wheels raised free, thus providing convenient draining position. Heavy angle iron frame, tubular handles, all welded construction. Two 8" roller bearing wheels. Weight 90 lbs.

Detachable Handles. When used as drain or storage rack, handles can be detached. Thus conserving floor space and permitting one pair of handles to serve any number of trucks.

Item NS-506 **$42.50** (Handles welded to frame)
Item NS-506-R **$32.50** (Item NS-506-DH without handles)
Item NS-506-DH **$44.50** (Truck and detachable handles)
Item NS-506-H **$12.00** (Detachable handles only)

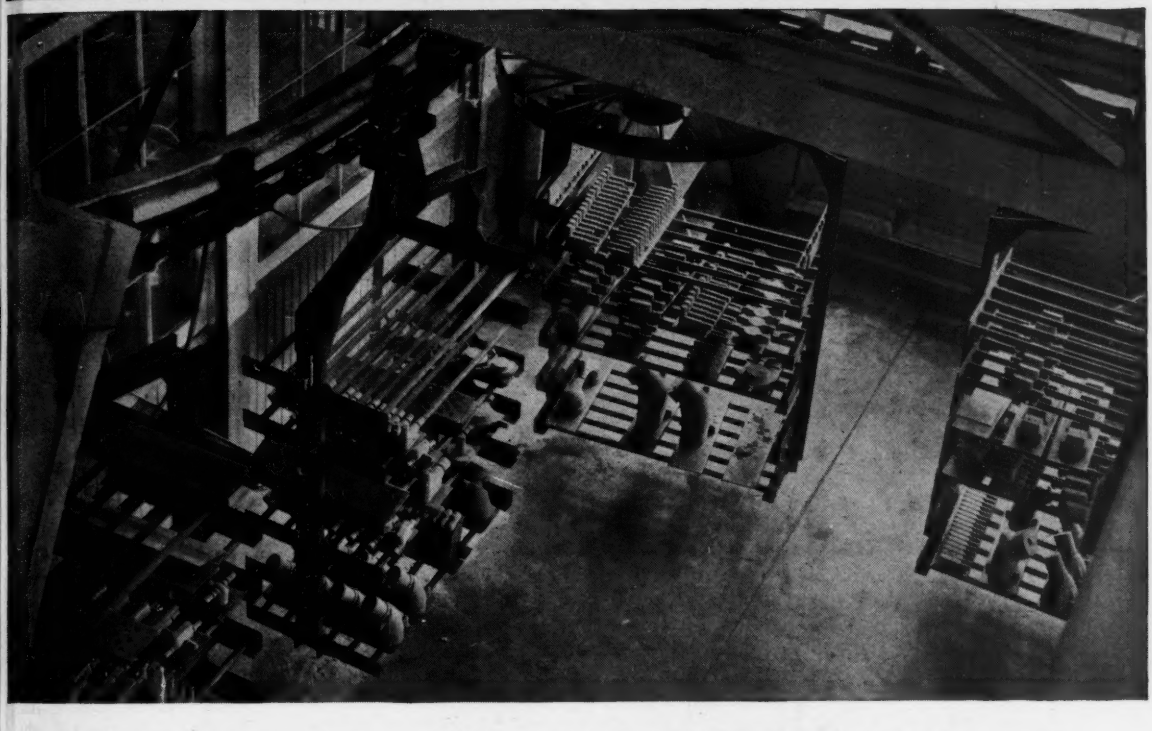
We Design and Build all types of Trucks, Skids, Pallets, Platforms, Racks, Boxes, Bins, Tables, for Pick-up, Loading, Moving, Shipping, Dumping and Storage.

113 **Palmer-Shile Co.**
7170 West Jefferson Ave., DETROIT 17, MICH.

Mathews

TROLLEY CONVEYERS

Engineered to serve Production



Trolley Conveyers are being applied in modern foundries for handling materials, usually cores and castings, through Production Departments, from one building to another, and in many other ways are operating to serve production. Transverse bends lower the loads to working height, keeping a continuous flow of materials reaching the working area. The conveyers do their work without occupying valuable floor and aisle space. They can serve one or several floor levels, and can be applied inside or outside the buildings. Variable speed drives make possible the exact control of the material reaching the working areas and the many types of hangers available add to the flexibility of the conveyers. Mathews Trolley Conveyers, like other prominent Mathews types for foundry application, are on the job today in many of the nation's great foundries. A Mathews Engineer operates in your vicinity, and would appreciate an opportunity to help you with that conveying problem.

Mathews Conveyer Company

ELLWOOD CITY, PENNSYLVANIA

CARGO – SERVED UP AIR LINE STYLE!

To TWA—long one of the world's leading air lines—a single minute can mean five miles travelled in the air, or five miles lost on the ground. More than a year ago, Trans World Airline set out to shorten cargo handling time at terminals to keep pace with faster flight schedules made possible by improved aircraft.

After making a thorough study of its existing handling methods and investigating the methods and equipment used by other air lines, as well as by the Army and Navy during the war, TWA selected Towmotor Lift Trucks and Industrial Tractors, basing its choice on Towmotor's performance in handling all types of air cargo.

An unusual application of the lift truck system was worked out by TWA, whereby special 4-wheeled cargo trailers are moved in trains to plane side by Towmotor Tractors, at which point a Towmotor Lift Truck raises each trailer to plane loading level. This arrangement not only speeds up loading and unloading, but the trailer itself provides extra working space for cargo handlers, simplifying movement of cargo in and out of the plane and expediting balanced loading, particularly important in air transport.

The use of 4-wheeled trailers with Towmotor Tractors also enables TWA to collect various types of cargo, such as baggage, air mail and air express, at separate points in the terminal and move it rapidly and safely to plane side for loading. Similarly, unloaded cargo is distributed quickly and carefully to various locations at the airport.

For every handling problem there is an engineered solution . . . a solution based upon Towmotor experience and know-how gained in solving handling problems in every industry. Send for your copy of the Towmotor Lift Truck ANALYSIS GUIDE today. Towmotor Corporation, Div. 12, 1226 East 152nd Street, Cleveland 10, Ohio.

TAKE IT UP WITH

TOWMOTOR

THE ONE-MAN-GANG